

In This Issue—*Building a Big Business in a Small Town*

MOTOR AGE

Vol. XLVI
Number 2

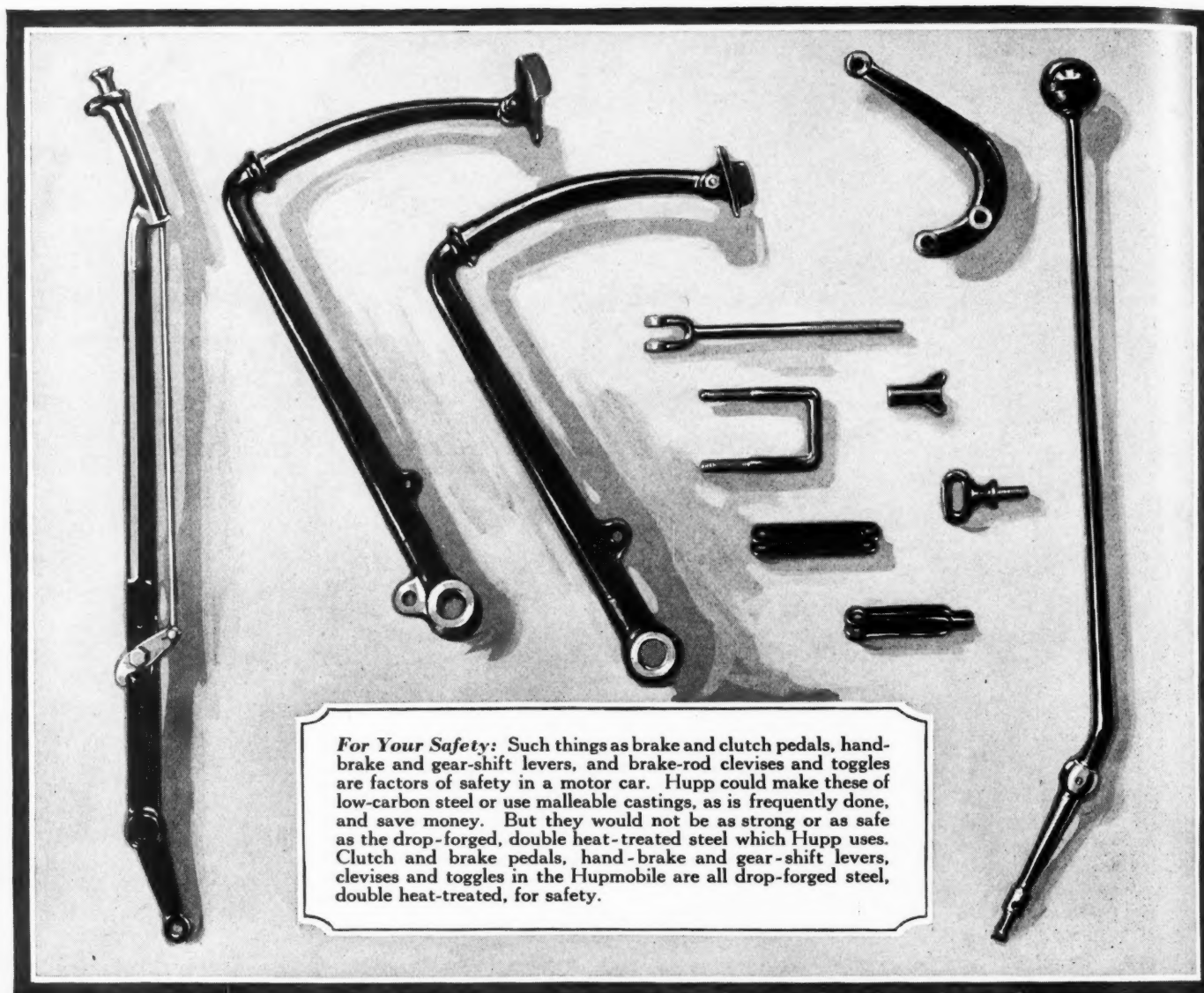
PUBLISHED WEEKLY AT 5 SOUTH WABASH AVENUE
CHICAGO, JULY 10, 1924

Thirty-five Cents a Copy
Three Dollars a Year

**THE Great Jordan Line
Eight will revolution-
ize the whole merchan-
dizing situation in the
automobile industry.**

**Dealers who do not see it
now may write and
learn what everyone
will be talking about
six months from now.**

Edward S. Jordan
President
Jordan Motor Car Company
Cleveland, Ohio



Greater Numbers Buying Hupmobile Because No Car Surpasses It In Value

For some years—both in good times and in bad—Hupmobile sales have gained steadily in proportion to total motor car sales.

This has been strikingly true in those periods when motor car sales generally showed a sharp decline.

The reasons for this, primarily, are first, the great value of Hupmobile from the investment viewpoint, and second, the fact that it gives the public what the public wants most in a motor car.

The most important consideration is that the car be strong and rugged,

made of good materials and finely fabricated.

Here, then, are the essentials—and they are the very features for which the public has always admired the Hupmobile.

Parts displays have been placed in its dealers' hands. In these displays are the major units of the Hupmobile.

So that there, before the prospect's eyes, are the facts. They prove, beyond the shadow of a doubt, that value is as finely built into the Hupmobile as in any car, regardless of price.

We tell the prospect this—that until

and unless he finds a car that equals the Hupmobile in quality of materials and fineness of workmanship, he is getting less than his money's-worth in automobile value, however pretty the other car may look.

Go to the Hupmobile dealer and make your own check. What you see there will convince you that no other car equals Hupmobile in the essentials that go to make a car good. These parts displays will prove that the Hupmobile is a better car for a man to buy, and a better car for a dealer to sell.

Hupp Motor Car Corporation
Detroit, Michigan

Hupmobile

QUALITY Piston Rings



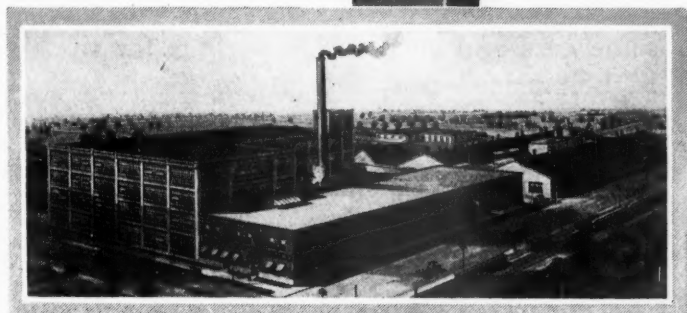
NOV. 30, 1911



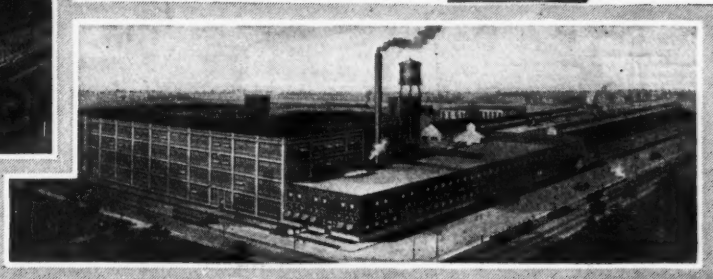
DEC. 1, 1912



JUNE 15, 1915

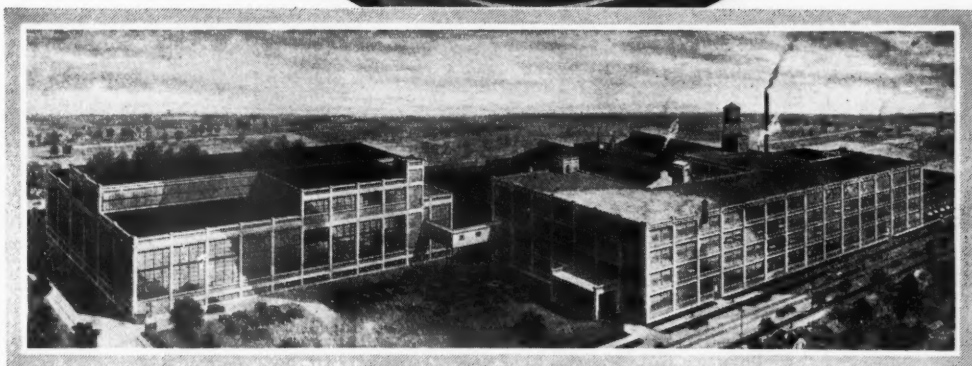


SEPT. 1, 1916



SEPT. 1, 1920

MAY 1,
1924



Positive Proof of the Quality
in ***QUALITY*** Piston Rings

It pays to sell Ford Springs— Especially Trainors!

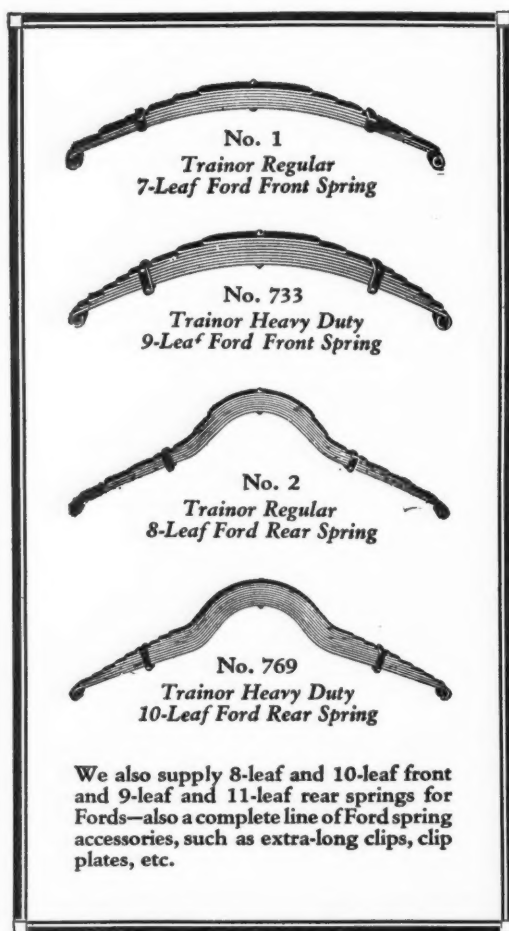
FORD Springs are staple—and they sell in volume the year around, because the market is enormous and rapidly growing.

It pays especially to sell TRAINOR Ford Springs, because they meet the demands of Ford service—and keep your customers satisfied.

TRAINOR Ford Springs are made with the same care and accuracy as springs for the highest priced cars—by one of the oldest and largest spring makers.

If you are not already selling TRAINOR Ford Springs, it will pay you to start now. Order through your jobber or write to us.

TRAINOR NATIONAL SPRING COMPANY
NEW CASTLE, INDIANA
Export Dept., 256 Broadway, New York City



TRAINOR SPRINGS for FORDS

MOTOR AGE

Reg. U. S. Pat. Off.

Published Every Thursday by

THE CLASS JOURNAL COMPANY

5 So. Wabash Ave.
Chicago, Ills., U. S. A.

Vol. XLVI

Chicago, July 10, 1924

No. 2

CONTENTS

Builds Big Automotive Transportation Business in Small Town	9
Greater Power Output From Franklin Engine.....	12
Engineers Heed Car Owners' Criticism.....	15
Develops Million Dollar Parking Business.....	16
Comparing Race Car Design With Commercial Practice	17
<i>By B. M. Ikert</i>	
How Dodge Bros. Teach Public Used Car Values.....	23
Display Does Make a Difference.....	24
Motor Age's Picture Pages of Automotive Interest	26
Editorials	
The 10,000,000th Ford.....	28
The Transportation Store.....	28
The Mail Flies at Night.....	29
New Models.....	29
Accessories or Necessities.....	29
A Phenomenal Plan.....	29
The Readers' Clearing House	
This Oakland Probably Has Piston Slap.....	30
A Question of Years and Models and Law.....	30
This Would Cost About \$100,000.....	31
Fitting Piston Pins in Piston Bushings.....	32
Recommended Tappet Clearance for Fords.....	33
Generator Regulator Explained.....	34
Heat Treating Auto Parts.....	35
Boosting Accessory Sales.....	36
Quick Service and Flat Rate a Good Combination	37
Putting Touring Appeal in Window Display.....	38
Squeeks & Rattles	39
News of the Industry	
Stop Kansas City Race at 150 Miles.....	40
June Output About 15 Per Cent Under May, Survey Indicates	41
Developing Star and Durant Sales, Campbell's First Task	42
Two New Tire Models to Be Offered by Akron Factories	43
Finds Columbia Dealers in Best Shape of Several Years	44
Note Improvement of Car Movements in the Southeast	45
Wills-St. Claire Making Profit; Closes for Inventory.....	46
Sales Prospects Are Brighter Among Dealers in Milwaukee	46
Wider Use of Motor in Short Hauls Given Referendum Okay	47
Citroen Announces Price Increase of Thousand Francs	48
De Dion Bouton to Take Over Bellanger Plant, Near Paris	48
With the Associations	49
Business Notes	50
Concerning Men You Know.....	51
In the Retail Field	52
Coming Motor Events.....	53
Specifications	54
BROADCASTER DEPARTMENT	
117	
INDEX TO ADVERTISEMENTS	
118-119	

SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....	\$ 3.00 per year
Canada	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies	35 cents

Subscriptions accepted only from the Automotive Trade
Entered as Second Class Matter Sept. 19, 1899, at the Post Office
at Chicago, Ill., under Act of March 6, 1879.

Chevrolet & Overland Dealers



\$12.00 Denver
and far West

You Can Sell Your Cars Equipped with the Famous JOHNSON TRANSMISSION LOCK

The famous Johnson Transmission Lock is now made for CHEVROLET and OVERLAND cars!

More profit for you! Theft protection for your customers—for only \$11.00! The Johnson Transmission Lock is sold exclusively through authorized car dealers and used as standard equipment on many well-known cars.

It is an exact duplicate of the gear-shift lever on the car, but with a theft-proof locking device. A housing forces a steel plunger down between the gear-shifting forks. Prevents engagement of the gears. **LOCKS THE CAR IN NEUTRAL.** Convenient to lock and unlock. It's up off the floor, away from dirt.

Hundreds of thousands are in use. Saves its cost in insurance premium savings.

Your customers want the Johnson Transmission Lock. It makes it easier to sell the car. Means extra profits! Write at once for discounts.

ADDRESS DEPT. A

Johnson Automobile Lock Co.

Makers of the famous
Johnson armored cable Spare Tire Lock
and the new
Johnson Nutlok, for Spare Tires and
Spare Disc Wheels

St. Louis, U. S. A.

Johnson

TRANSMISSION LOCK

Save 1 to 4 hours

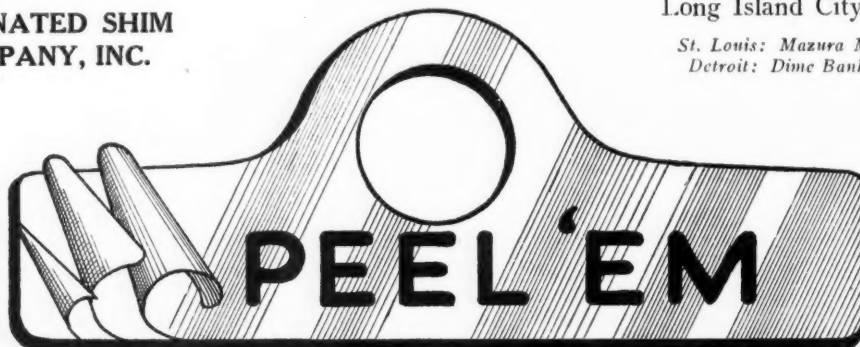
Think of saving from 1 to 4 hours when adjusting bearings! Consider also, that this extra time can be put to good use on some other job. Not only do you increase your profits and cut your labor, but the adjustment is absolutely accurate and this means *a satisfied customer*. Don't file. Don't fuss with loose leaves. **PEEL** your shims. A shim for every make of car. Your jobber sells 'em.

Address "Sales Department"

**LAMINATED SHIM
COMPANY, INC.**

14th St. and Governor Pl.,
Long Island City, N. Y.

St. Louis: Mazura Mfg. Co.
Detroit: Dime Bank Bldg.



LAMINUM

This combination of advantages—means leadership to you!

STUDEBAKER leadership is not only the result of obviously fine quality, convincing performance and very fair and reasonable prices.

Studebaker leads because it combines a number of advantages beyond the car itself, although a Studebaker car is known everywhere as one of the finest cars on the market.

These things are vital in Studebaker leadership:

STABILITY AND PERMANENCE: A history of 72 years of business success is a sure indication of permanence.

REPUTATION: Unquestionably good wherever automobiles are used.

A CAR WHICH FITS THE MARKET: Three models in 13 body types, with a price range from \$1,025 to \$2,685.

SERVICE FACILITIES: Repair parts always promptly available from Branch supplies—convenient to every part of the country, and at reasonable prices.

GREAT RESOURCES: A \$90,000,000 company operating one of the finest industrial plants in the world, and producing cars of the highest mechanical excellence at quantity production prices.

These are the advantages back of every Studebaker dealer; and a guarantee of his leadership.

LIGHT-SIX 5-Pass. 112-in. W.B. 40 H.P.

Touring	\$1045
Roadster (3-Pass.)	1025
Coupe-Roadster (2-Pass.)	1195
Coupe (5-Pass.)	1395
Sedan	1485

SPECIAL-SIX 5-Pass. 119-in. W.B. 50 H.P.

Touring	\$1425
Roadster (2-Pass.)	1400
Coupe (5-Pass.)	1895
Sedan	1985

BIG-SIX 7-Pass. 126-in. W.B. 60 H.P.

Touring	\$1750
Speedster (5-Pass.)	1835
Coupe (5-Pass.)	2495
Sedan	2685

(All prices f. o. b. factory)

Studebaker

THE WORLD'S LARGEST PRODUCER OF QUALITY AUTOMOBILES

It is Oakland's Avowed Purpose to Merit Leadership

It is Oakland's avowed purpose to continue to lead the cars in its class—not in the mere *numbers* it builds, but rather in *character* and *ability*.

If a policy such as this helps you to build up a permanent and successful business; if the latest and best, at all times, in car design and advanced features are a selling asset for you; if you desire and appreciate alert and helpful factory cooperation—then an Oakland franchise offers a mighty attractive opportunity now and for years to come.

Oakland's dealer organization is larger and more successful today than at any time in Oakland's history. Oakland's True Blue car has made good. Owners are enthusiastic. There never was a better chance to secure a permanent, successful line with a real future. Write for the convincing story.

OAKLAND MOTOR CAR COMPANY
PONTIAC, MICHIGAN

Roadster . . . \$ 995
Sport Touring . . 1095
Sport Roadster . . 1095
Business Coupe . 1195

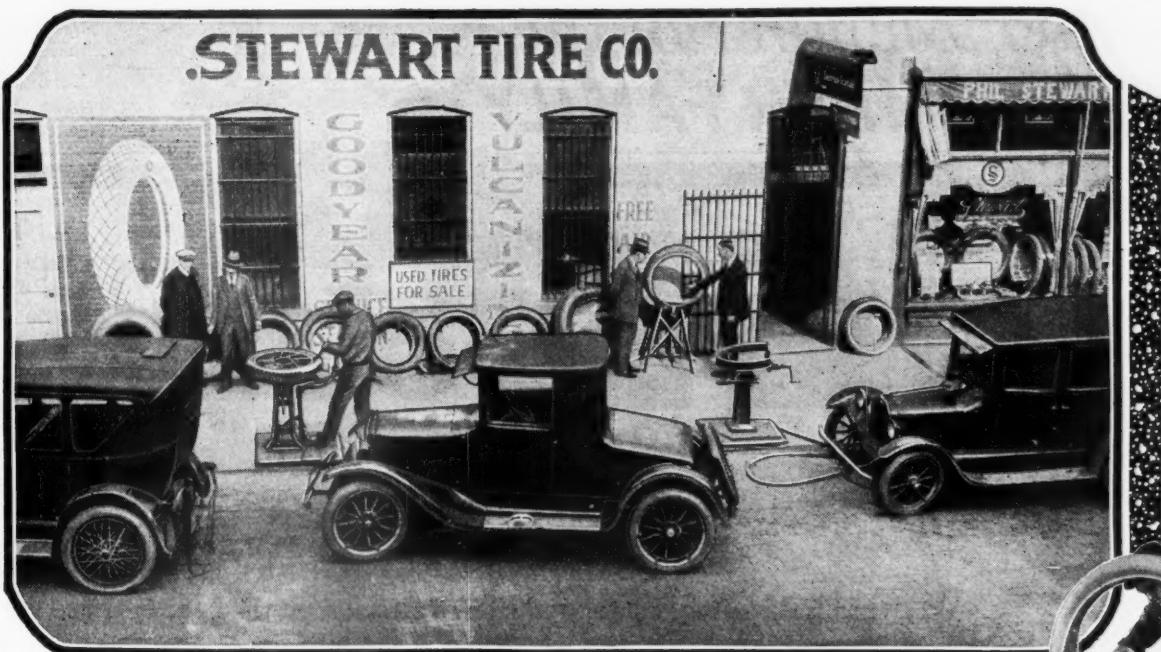
Coupe for Four . \$1395
Sedan 1445

Glass Enclosure for Touring
Cars \$60—for Roadsters \$40
All prices f. o. b. factory

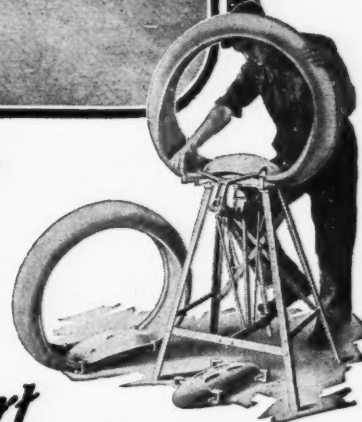
True Blue
Touring Car



\$995⁰⁰
f. o. b. Factory



A WEAVER Tire Changer and Tire Spreader *will prove as big money-makers for you as they have for Phil Stewart*



Weaver Tire Spreader

"Since I started in business years ago selling new tires and repairing old ones, my main objective has been to give my customers the kind of service that would bring them back for more.

"That's why I have three Weaver Tire Changers and a Weaver Tire Spreader working for me now. They have paid for themselves many times over in the time and labor they have saved. And they have proved a mighty good ad for the shop.

The new Model E Universal Tire Changer handles wire and disc wheels and all types of solid and split rims

"The Spreader not only enables us to locate cuts or breaks in the casing far more quickly but also helps sell new tires, because with it we can show the customer just what shape his casing is in.

"The Changers are all mounted on the curb, so my customers can get quick service and can see how carefully we handle their tires and rims. I'm especially proud of my newest Changer, Model E. With it I can handle practically any size tire, including 'balloons', on wire or disc wheels or any type of solid or split rim. I don't see how we managed to get along before we got it."

Weaver Tire Changers and Spreaders will increase profits and patronage for you just as they have done--- and are doing--- for Phil Stewart and thousands of other shops the country over. Put them to work for you now and cash in on the busy season. For complete information, ask your jobber's salesman or write for catalog.

Weaver Mfg. Co.
Springfield, Illinois, U. S. A.
Weaver Canadian Co. Lt.L., Chatham, Ont.



THE BEST EQUIPPED SHOP GETS THE BUSINESS



Another Member of the
WEED BUMPER FAMILY

List Price Complete:
 Black, \$21.00
 Nickel, \$23.00
 Bars Only:
 Black, \$14.00
 Nickel, \$16.00

WEED FENDER GUARD

THERE is a big call for collision protection on the rear of those cars which have no space for regular bumpers because of a projecting trunk or spare tires.

Notice how well the Weed Fender Guard meets this situation. Observe that it is designed to be fastened completely across the frame as **ONE PIECE**, to hold as rigid as a **WEED BUMPER**.

Also recommend Weed Fender Guards for the "short garage" where there is insufficient clearance to allow for the length added by regular bumpers. No need to carry a big stock of special fittings—the regular Weed Bumper Fittings will fit all but a few cars, for which special fittings are provided.

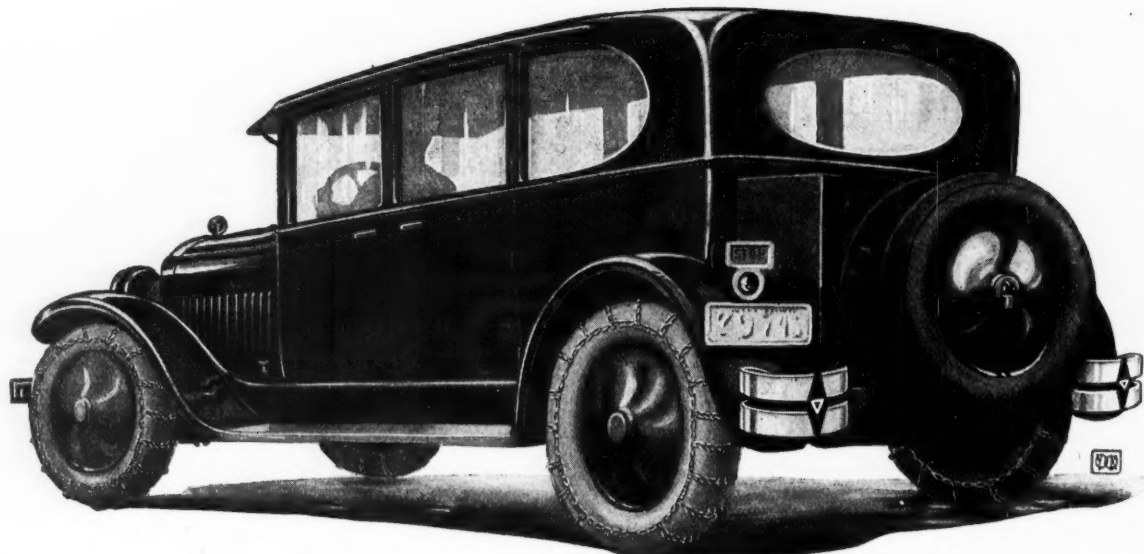


AMERICAN CHAIN COMPANY, INC.

BRIDGEPORT, CONNECTICUT

In Canada: DOMINION CHAIN COMPANY, LIMITED, Niagara Falls, Ontario

District Sales Offices: Boston Chicago New York Philadelphia Pittsburgh San Francisco
World's Largest Manufacturers of Welded and Weldless Chains for All Purposes



MOTOR AGE

Builds Big Automotive Transportation Business in Small Town

Charles E. Neal Started in Garage Business in Ramshackle Building at Cotulla, Tex., 12 Years Ago—Today He Is Successful Dealer

HERE is the absorbing story of the advancement of a small town man from an insignificant garage business to a successful dealership and ownership of one of the best automotive transportation stores in Texas. It is the story of determined and persistent effort and the application of progressive ideas to his business. The little town of Cotulla numbered slightly more than 1000 inhabitants when the 1920 census was taken, and yet last year Charles E. Neal sold 250 automobiles from his new store. But he also sold accessories, supplies, equipment and highly satisfactory maintenance. The story of his success as published here is reprinted from his home town newspaper, the Cotulla Weekly Record.

(From the Cotulla Record.)

THE Charles E. Neal Auto Company stands out today among the leading Ford agencies of Texas; and the home of the agency, the splendid brick and plate glass structure, with a floor space of nearly 20,000 square feet on the corner of Front and Tilden streets, stands as a monument to the undaunted courage and persistency of effort of the man, Charlie Neal.

We knew Charlie when he was a cow-puncher working for \$15 per and his "chuck" and as time goes, that has not been such a long time ago. Then, again driving a mule scraper team in railroad construction in east Texas. But one day he saw an automobile, or at least one of the first contraptions that were put out in those days and called automobiles,

and the wheels of faster ideas began working in his head. The introduction of this swifter vehicle of transportation into his life at this stage changed the course of his destiny.

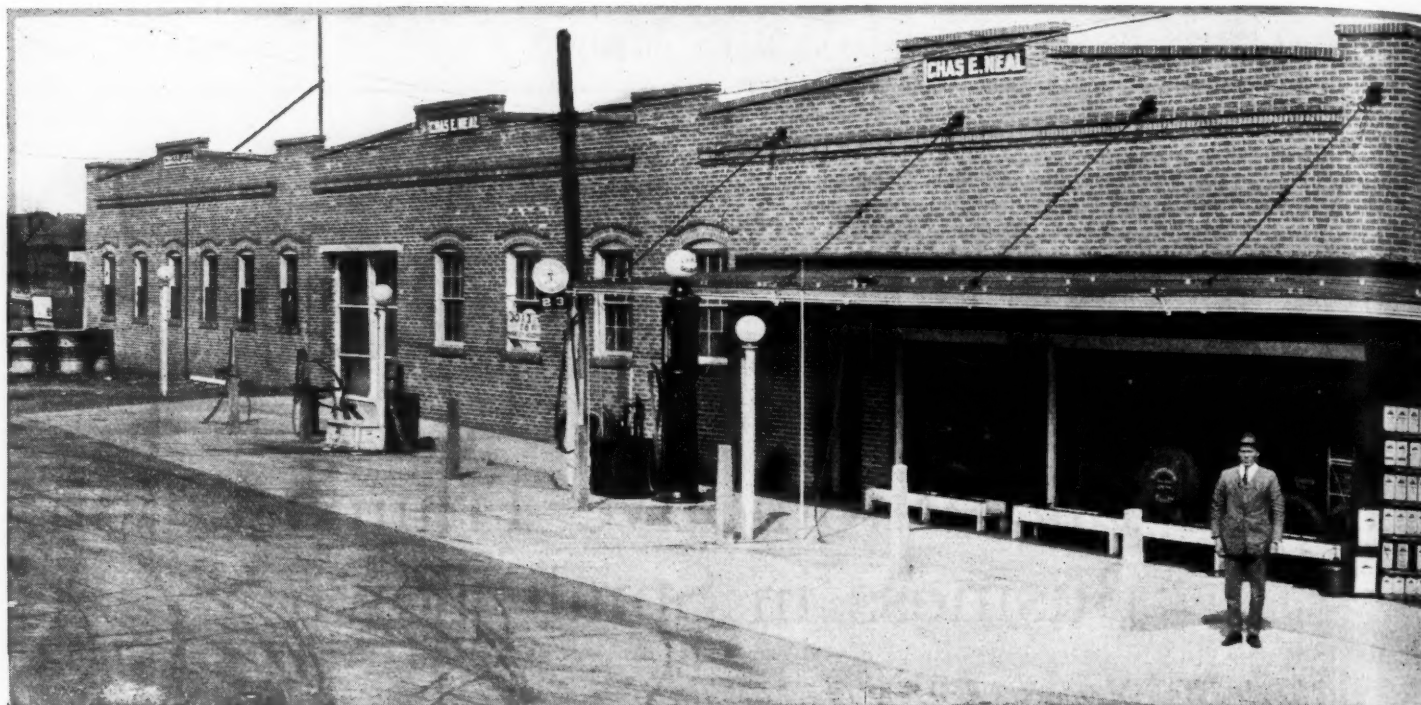
The beginning of Mr. Neal's career as an automobile man dates back to 1910, when he bought a second-hand Rambler from Ray Seefeld, and this car has the record of making the first trip to Laredo and entering a Washington's Birthday celebration parade. On returning next day, D. E. Colp, now vice-president of the Meridian Highway, accompanied him and all along the route were many dead snakes.

Cause of Dead Snakes

Mr. Colp asked the cause of so many dead snakes and Charlie answered by

telling him that the snakes had tried to follow the tracks of the Rambler the day before and the trail was so crooked that they broke their backs in the effort. After some time Charlie traded off his Rambler for a Mitchell, and in 1912 Cotulla boasted of two automobiles. The other was owned by Roland Gouger.

After a few months it was decided between Neal and Gouger that the town ought to have a garage to take care of their cars, and Neal rented an iron roof building with barbed wire walls that formerly had a blacksmith shop in the front end, employed a Mexican mechanic (who knew how to fix windmills) at a dollar a day, and opened a garage. Mr. Neal was proprietor and Juan Sanchez was foreman. Business was pretty good because



The establishment of Charles E. Neal, Ford dealer at Cotulla, Texas, where, in a small town, he has built

both cars were in the shop most of the time.

However, in the course of a few months a few Fords and one or two other makes made their appearance, and business picked up somewhat. One day it happened that all of the cars in LaSalle county were in town and the occasion was celebrated by having a photograph made.

A Case of Laughing Last

In 1914 Mr. Neal came to the conclusion that he would like to own the lot and building he was in, but the owners wanted \$1,800 for it and that seemed a huge sum to him, but he set to work in an endeavor to finance it. Local bankers wouldn't finance him and he couldn't make any of his friends see where it was a good business proposition, but he finally raked together \$600 and gave notes for the balance and set to work fixin' up the place.

Two or three local men had had the agency for the Ford, and in 1915 the Ford company adopted its system of requiring agents to contract so many cars for the year. The agency went begging in Cotulla then, but Mr. Neal had a notion that he could make it go. His friends told him he was crazy; that there was nothing to it.

However, he went up to see the district manager, but when he found out that the requirement for a sub-dealer's contract for LaSalle county was 24 cars, he all but threw up his hands, and if he had not been "kidded" so much by his friends about his wild dreams, probably would have passed it up, but he didn't. With a determination to show the fellows at home a few things, he signed up a sub-agency contract for 24 cars. He came

back home and after much effort finally sold one car.

He had to go to the Sames-Moore Company at Laredo to get this car, and just about the time he was preparing to depart on his mission, in came Charlie Gray, salesman for the Goodyear Tire Company. Neal felt a little "swelled up" over his first sale and was not inclined to talk business with the tire man, but Gray was a good salesman and didn't let up on him, and Neal finally made him a proposition that, if he, Gray, would go to Laredo with him and drive the new Ford back, he would give him an order for three 30x3 and three 30x3½ tires.

Gray accepted. It required three days to get an order for six tires, but in those days that was considered a good order, and Mr. Gray says that was about the most profitable three days he ever worked, as the Neal Auto Company has been a continuous customer and has purchased thousands of tires since that time.

During the next few months Charlie almost lost faith in his venture. He couldn't get people to buy cars. They were afraid of the infernal things. He couldn't get the natives to take a little ride in them, much less buy. They were just as much afraid of the gasoline critters as most people are of airplanes now.

Ties Up With Ford

Another thing, the first cars he got hold of were 56-inch tread, whereas all the previous cars were 60-inch, the width of the wagon roads. The few prospects that he had were afraid of these "narrow gage" cars. This writer well remembers that he was contemplating taking on a Ford, but hesitated because of the 56-inch tread.

Finally we asked Charlie what he

thought about it, and he replied that he and Henry Ford were going to put "buckboards" and country roads out of business and in a few years there wouldn't be anything but Fords and good roads—so we bought.

But, as time passed, things gradually changed and the year wound up triumphantly, every car of the 24 contract sold. Mr. Neal had done so much better than most of the country agents that the district agent called him in and gave him a direct agency with a 54-car contract. That required more building improvement and the first glass windows of any building in Cotulla were put in. The dirt floor gave way to a cement floor.

Two Carloads of Tractors

A storage room was added on the north side. Things were going fine, until in August of that year along came the first gulf hurricane this section had ever known, and what was left of Mr. Neal's garage was a sad sight—and no storm insurance.

It was almost a death blow, but right here Charlie demonstrated that he was made of the stuff that won't down. Up to this time he had paid off his notes on the original building purchase, made improvements and accumulated \$1,200.

It took every cent of this and all he could borrow to replace the buildings, but in less time than you can imagine he was "going again" and that year put over his 54-car contract.

In 1917 he went over the top with 72 cars. In 1918, 96 cars, and these were war years, too, and the greatest drouth year this country has ever known. In 1920 he sold 144 cars. In 1923 his contract called for 250 cars, both Lincoln and Ford, and tractors.

Back in 1918, before the Ford company



a big business and is daily enlarging it. Mr. Neal's story is an interesting one and an inspiring one as well

required agencies to take on the Fordson, the Neal Auto Company ordered two carloads of tractors and sold them. In this same year Mr. Neal's business foresight induced him to buy up all of the property fronting Front street in the block where he made his first purchase, and in 1919 his business had grown to such an extent that new and more modern buildings were required. Thus he began the erection of a section or installment of his new modern plant.

This was a brick, 45x125, all cement floor, glass front. This was on the second lot from the corner. At this time the Ford company was requiring dealers' buildings of certain character, and this building was not being constructed according to their plans, but Mr. Neal's idea was to use the building he was then constructing for occupancy during a period when another building according to Ford plans was being put up on the corner later. The Ford company did not understand this and sent a man down to see about it, but Charlie simply outtalked him, and the Ford representative sent in a report of his approval.

Corner Building Erected

In 1920 the corner building was put up, modern office, sales, parts and service floors, and in addition another large storage building was erected on the north of the first building. This plant is as modern and up to the minute as any metropolitan store.

However, the accomplishments achieved were not as easy as they read. There were ups and downs in the business, and obstacles unlimited. There were incidents, humorous and serious, all through the years of Mr. Neal's hill climbing that would make a volume of reading. A large majority of the Ford agencies were

established in the hands of men who had money in the beginning to finance the business, or stock companies were organized with sufficient capital.

The instances where men began without money, experience or credit and within a very few years established a really big business, are few indeed. Mr. Neal put system and service into his business at the very beginning. His strict attention to business and demonstration of his business ability enabled him to secure financial assistance in 1919 in the erection of his modern plant from one of the largest banking institutions in the border country.

Besides building a business for him-

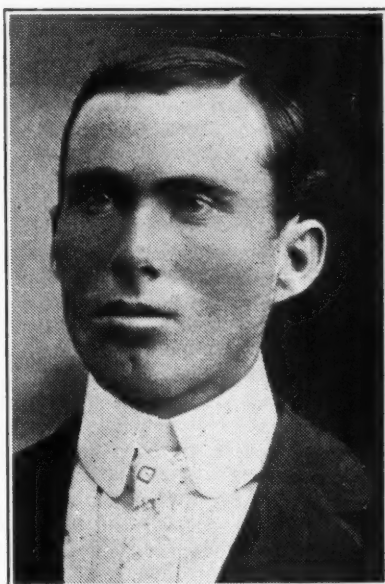
self, Charlie Neal has been one of the most public-spirited men the town has had. It is a recognized fact that he set the pace for the many improvements in the business section the past few years. To him is due much of the credit for getting things in the old town out of the rut. He always has been and always will be ready to "go" for every betterment of the town and county. No man has contributed more to the upbuilding of Cottulla than has Charlie Neal.

The Charles E. Neal Auto Company today is recognized by the Ford district office as one of the most modern, neatest kept, best systematized dealerships of the 250 under its supervision. The Ford bookkeeping system is employed. Every department is in charge of a specialist in that line. Service floors are equipped with every modern tool and mechanical device for speedy and accurate work.

Equipment Installed

Electric-driven machinery of every description necessary to prompt and satisfactory service has been installed. Salesmen who cover the entire state say that nowhere in their rounds do they find a Ford dealership where the Ford system is so thoroughly carried out. The people who are employed are loyal to the organization. Some of them have been with Mr. Neal almost since he began his business. Practically all of them have good homes, and the head of the organization has assisted them in securing these homes.

The service dispensed by the Charles E. Neal Auto Company is known far and wide, and in these days service is one of the essential things it takes to build bigger business. The Charles E. Neal Auto Company of today is the product of sheer grit and persistent effort.



Charles E. Neal

Greater Power Output From Franklin Engine

Improvements in Air Cooling and Changes in Inlet and Exhaust Systems Responsible. New Model Designated as 10-C. Stromberg Carbureter Now Used. Protection for Transmission Brake New Feature

IMPROVEMENTS in the air cooling system of the Franklin engine have made it possible to greatly increase the power output of that engine and thereby to increase the acceleration and maximum speed of the car. The increase in power was brought about directly by changes in the inlet and exhaust systems having a favorable effect on the volumetric efficiency, which considerably increased the speed at which the engine peaks, but the improvements in the cooling system referred to were essential to the increase in power, because—as is evident—with increased output heat must be disposed of by the cooling system at a more rapid rate.

The new model, embodying the various changes described in this article, is known as the 10-C and is now in production. As compared with the previous model, the 10-B, the peaking speed has been increased from 1700 to 2200 r.p.m. and the maximum horsepower by about 33 per cent. At a car speed of 50 m.p.h. the engine output is even 49 per cent greater than on the previous models.

The area of the cylinder cooling flanges has been increased from 5 by $\frac{1}{8}$ in. to 6 by 1 in., which has resulted in an increase in the total cooling area from 3600 to 4550 sq. in. The volume of air passing through the cylinder jackets in unit time also has been materially increased, from 2400 to 2700 cu. ft. per minute at 2000 r.p.m. for instance, with practically no increase in power consumption by the fan. More air is pumped, but the resistance to flow is lessened and these two factors practically balance each other.

As a result of the various changes to be described, the maximum compression pressure has been increased from 63 to 72 lbs. p. sq. in.

As regards the changes in the cooling system, the radiating fins, which on the Franklin engine are of sheet steel, extending parallel with the axis of the cylinder and having their outer portion turned at right angles so as to form a cylindrical jacket through which the air from the blower passes, have been increased in depth so as to bring the outside diameter up from $5\frac{1}{4}$ to $5\frac{5}{8}$ in., and their length also has been increased so they now extend further down the cylinders.

The blower housing and the connecting air duct to the cylinder which in the past were made of cast aluminum are now made of pressed steel, and with substan-



The front of the Franklin hood now carries this ornament, known as the Franklin lion

tially the same outside dimensions these parts have greater cross-sectional areas. Slight changes in form also have been made, with the result that with the same impeller the rate of air flow for a given engine speed is now considerably greater. The air housing is stamped in parts, the different parts being joined together by spot welding and bolting.

In the past the Franklin company has been using a carbureter of its own make, but this has now been replaced by a Stromberg with a larger air passage. While the new model will not have the dash carbureter control which has become a well-known Franklin feature, some of the other features of the Franklin fuel system have been retained, such as the electric primer for starting in cold weather and the exhaust type charge heater, both of which have been modified in design, however.

An Alemite Gascolator, a fuel strainer with a chamois filter in a glass bowl, at the bottom of which any dirt and water separated from the fuel collect, so that they can be readily seen and removed by the operator, has been added to the equipment, and is connected in the fuel line from the main tank to the vacuum tank directly at the entrance to the latter, which is a very accessible location.

The use of the United air cleaner is continued, but in order to minimize the effect on the volumetric efficiency, a larger size is now fitted.

The new electric primer is in the form of a U tube, in the lower part of which gasoline is maintained at a constant level by communication with the carbureter float chamber. In one section of the primer there is a coil of non-corrosive electric resistance wire, one end of which is grounded and the other connected to a binding post in the wall of the primer.

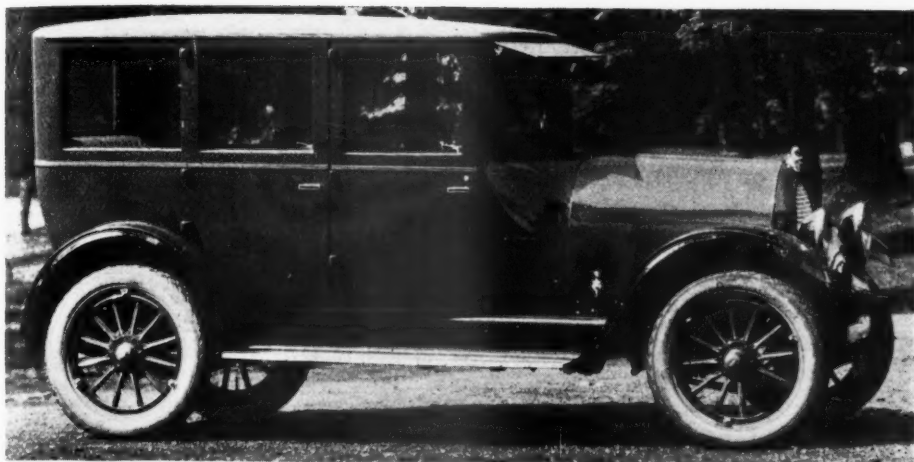
Air enters through small openings is drawn through the fuel at the bottom in the form of bubbles and becomes saturated with gasoline vapor. A portion of the electric conductor or heating element (which is heated by current from the storage battery) is submerged below the level of the fuel, while the coil proper is above this level and therefore comes in contact only with the mixture of fuel vapor and air. Near the outlet from the primer in a side pocket there is a suction-operated inlet valve D, through which additional air enters after the engine has begun to turn over. The primer delivers its mixture directly into the inlet manifold.

Communication between the gas heater and the inlet manifold is controlled by means of a solenoid-operated valve, the solenoid being connected in series with the heating element, so that the valve will remain open as long as the coil is heated.

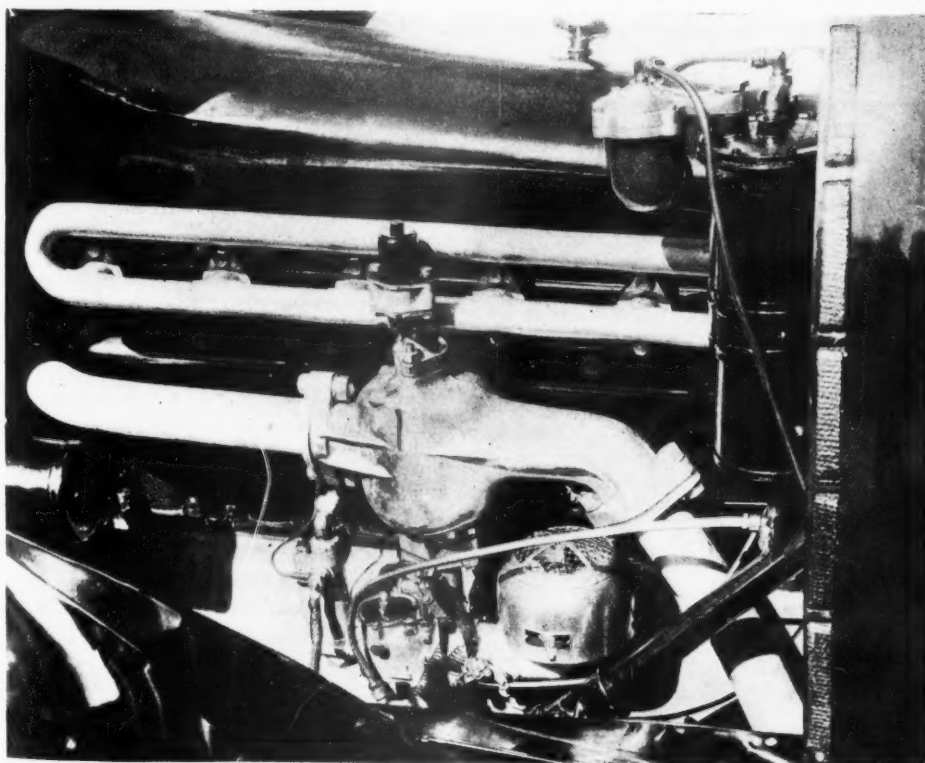
Another improvement in the primer consists in the provision of a screen at its primary air inlet. It is natural that when starting in very cold weather back kicks through the inlet manifold sometimes take place, and with the former arrangement this had a tendency to force a spray of gasoline through the primary air inlet of the primer. With the new arrangement of the air inlet this is rendered impossible.

It is claimed that with this new design of primer the engine will start consistently at temperatures as low as 5 degrees below zero, and that if the current is left on the primer for a little longer period before the starter button is depressed, starting is quite good even at 20 degrees below zero.

Another feature of the former model which has been retained in modified form is the charge heater. This consists of a jacketed uptake inserted between the carbureter and the inlet manifold. All of the exhaust gases from the engine pass



The new Franklin model 10-C sedan in which the maximum horsepower has been increased about 33 per cent



Above: Exhaust side of the Franklin engine showing the new cast exhaust manifold. Below: Inlet side of Franklin engine. This shows the Stromberg carburetor, larger "United" air cleaner, Gasolator on vacuum tank and other features

through the jacket, and the wall between the central passage and the jacket is provided with fins on both the inside and the outside, so that as much heat as possible with the limited dimensions of the device may be transferred from the exhaust gases to the incoming charge. The charge heater has been enlarged in size, but the arrangement formerly provided for separating any fuel particles that passed through the heater in the liquid form and returning them to the bottom of the device to be passed through again, has been discarded. A choke valve for starting is used with the Stromberg carburetor.

The exhaust manifold has been made much larger, and so have all parts of the exhaust system beyond the valves, to enable the engine to clear itself properly of the burnt gases at the higher speeds of which it is now capable. Formerly the Franklin exhaust manifold was built up of tubing, but owing to the larger size now used, it was found preferable to make it in the form of a casting. From the manifold, which is located on the right side of the engine, a so-called heater tube passes around the front of the engine to the exhaust heater in the inlet system, and this tube is now made 2 in. in diameter instead of 1½ in. The exhaust pipe also has been increased in size from 1½ to 2 in., the muffler from 5 to 6 in. and the air pipe from 1¼ to 1½ in. All flanges in the exhaust line are standard S. A. E. flanges and take standard gaskets.

In the past the Franklin company has made special efforts to reduce the weight of its car and to improve its fuel economy and perhaps it has not paid as much attention to the matter of acceleration as some other concerns, in which connection it must be borne in mind that high acceleration and economy are more or less conflicting requirements. Owners have become educated to the advantages of quick getaway and now call for it, and the changes which have been made in the Franklin design take care of this demand. It was realized that something had to be sacrificed in the way of fuel economy in order to make the car more "snappy," but it is stated that the loss is practically negligible, unless the car is driven at full power most of the time.

In the following table a comparison is made of the horsepowers under full throttle at different engine and car speeds, of the Models 10-B and 10-C, respectively:

H.P. 10-B	H.P. 10-C	R.P.M.	M.P.H.
			Approx.
8.5	9.3	500	10
17.25	20.2	1000	20
23.2	26.6	1500	30
22.72	30.75	2000	40
20.1	30.	2500	50

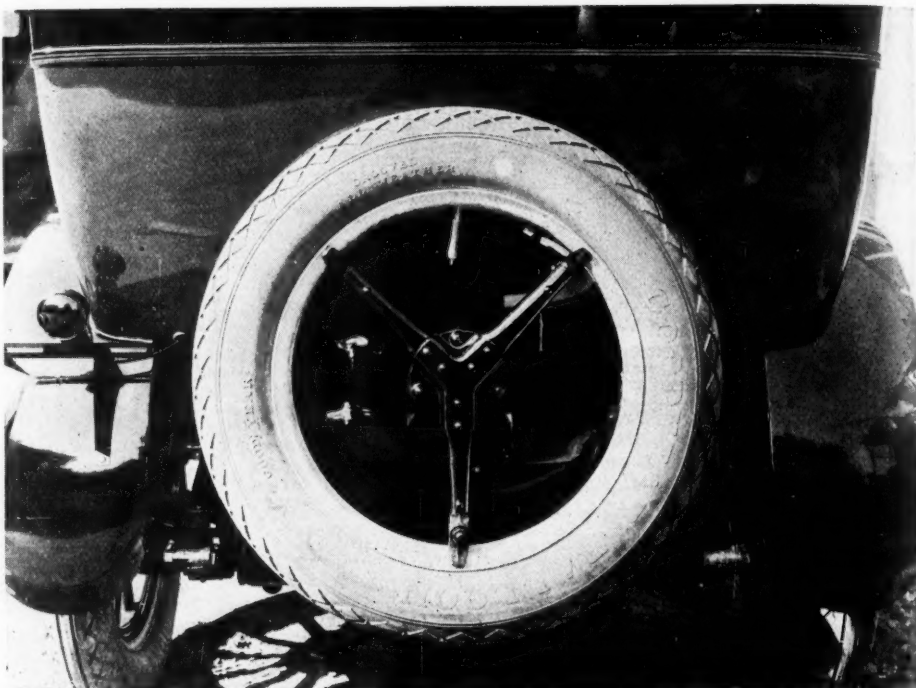
A change has been made in the engine lubricating system whereby oil is supplied to the cylinder walls more plentifully. In the past the Franklin engine has had a baffle plate at the bottom of the cylinders, which limited the amount of oil that reached the cylinder walls,

but this has now been done away with and, in addition, a hole is now drilled in the connecting rod head, which at a certain period in the rotation of the crankshaft registers with a radiant oil hole in the crankpin and permits a jet of oil to be thrown onto the cylinder wall. While this will increase the oil consumption somewhat, and under certain conditions may tend to render the exhaust smoke, it will reduce the internal losses due to friction and cut down the cylinder wear.

The instrument assembly on the dashboard remains substantially the same as formerly, the place of the fuel control valve having been taken by the choke control.

Franklin has long used a transmission brake, which serves as service brake and gives a very powerful braking action under all normal conditions. There are two possibilities of this braking action being impaired under certain conditions, and these conditions are guarded against in the new design. As the forward universal joint is located inside the brake drum, there was some chance of lubricant from this joint getting onto the brake drum and reducing the braking effect. This is now prevented by an oil guard in the form of a steel pressing which is clamped between the universal joint and its companion flange. This guard is dishpan-shaped, so that any oil which leaks out of the universal joint onto the guard has a tendency to work toward the outer edge of the latter and to be flung off, instead of accumulating on the inside.

The other cause of possible interference with the action of the brake is the



This shows the new tire carrier on the Franklin, comprising a three-armed spider with a detachable clip on one arm

splashing up of water or mud by the front wheels when running in ruts filled with water. This water is apt to strike the footboards and to be deflected by them onto the top of the transmission brake. This is now prevented by a sheet metal guard on top of the brake, as shown in the accompanying illustration.

A new form of tire carrier is fitted to the Model 10-C. At the rear end of the frame there is a box-section cross member, this section being used to ensure

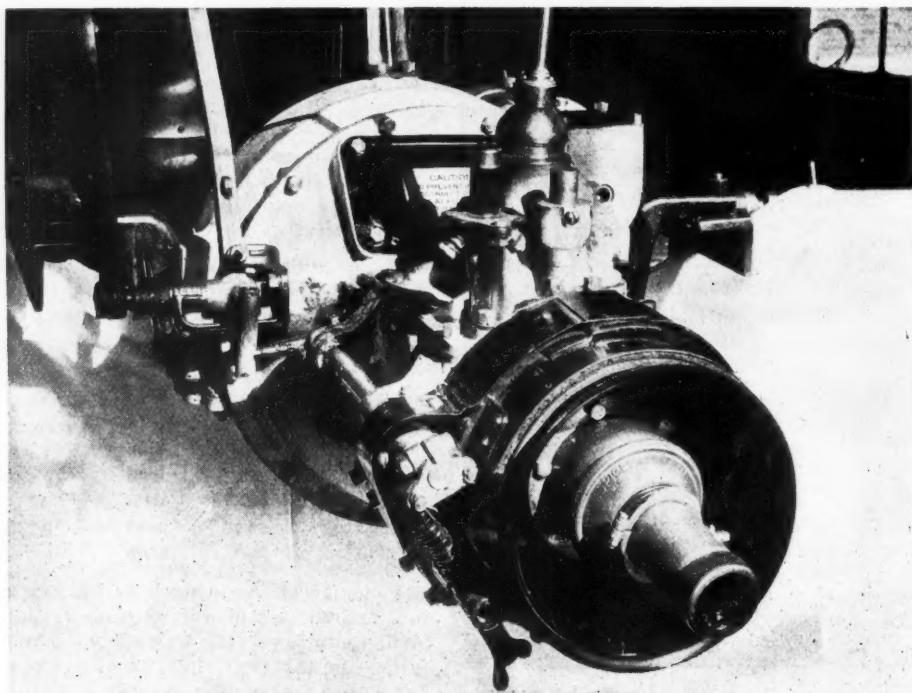
great resistance to torsional forces. The cross member covers and protects the fuel tank and has bolted to it at the middle the center-type carrier, as shown in the illustration. This comprises a three-armed spider with a detachable clip on one arm. After loosening this clip the spare tire can be lifted off.

Spare wheels of the wire and disk type can also be accommodated on the same carrier. In that case the three-armed spider is not used. For a wire wheel a dummy hub is placed on the central bracket, on which the wheel is secured, and a disk wheel is bolted to a flange on the bracket.

All of the new cars will be fitted with balloon type tires, 32 in. in diameter by 4.95 in. in section.

A demonstration of the acceleration of the new car was given to a MOTOR AGE representative in the vicinity of Syracuse recently. The car was a sedan and carried three passengers. The acceleration was determined by means of the speedometer and a stop watch. The speed increased from 5 to 25 m.p.h. in 8 1/5 seconds, and from 5 to 35 m.p.h. in 14 3/5 seconds, which acceleration from 10 to 50 m.p.h. required 24 seconds, this latter test being made over the same course in opposite directions and the mean of the two readings taken, so as to eliminate influences of grade and wind.

Hereafter all Franklin cars will carry a hood ornament in the form of a lion—the Franklin Lion.



Here is shown the protection for the transmission brake in the form of oil and water shield

Engineers Heed Car Owners' Criticism

S. A. E. at Summer Meeting Discusses Means of Improving Riding Comfort and Durability of Motor Vehicles

By NORMAN G. SHIDLE

AUTOMOTIVE engineers are looking to car owners more than ever before for suggestions as to improvement of designs. They are trying to find out what the public actually thinks of the cars they are building. Then they are going back into their laboratories to translate those general criticisms into specific terms so that they can be remedied in a practical manner. The technical men are showing a tendency to build up a closer association with the dealers so that through them a better contact with the public may be established. It is recognized that the opinions about design expressed by retailers usually are based on practical experience with owners.

This general impression was gained from the four-day meeting of the Society of Automotive Engineers held at Spring Lake, June 24-27, despite the fact that the papers and discussion presented dealt almost entirely with highly technical questions. The car owner didn't figure directly in the sessions to any great extent, but his point of view was in evidence frequently as the engineers argued one or another of the questions before them.

Problems Discussed of Paramount Importance

The topics selected for the meeting were chosen as being of paramount interest from the engineering standpoint today. But all of them involve owner comfort and convenience very directly. The problems discussed included riding comfort, crankcase oil dilution, transmission design, and air cleaners, and the viewpoint involved in the question, "What does the owner want?" was apparent in the attitude of many of the engineers.

One of the big problems facing the technical men in their study of riding comfort is to get an adequate and practical definition of the term itself. The analysis involves not only mechanical but psychological and physiological investigations and thus become quite complex in some of its ramifications. It is easy for the layman to distinguish in a general way when a car is easy riding and when it is not, but it is more difficult to express that feeling in concrete terms which will service as a basis for improvement in design. Opinions as to what constitutes riding comfort differ materially with various individuals and even with the same individual at different times. The problem before the engineers is to establish some sort of a general average on which to work.

Many efforts have been made in the last few months to develop instruments

for measuring riding qualities, certain desirable attributes being generally agreed upon. Professor E. H. Lockwood at Yale University, for instance, has developed a sort of integrating vertical accelerometer by means of which he has made tests of riding quality, while Professor E. P. Warner at Massachusetts Institute of Technology has conducted some interesting experiments by photographing the paths transcribed by lights mounted respectively on the axle and body of a car, and on the shoulder of a passenger riding in the car.

Professor Lockwood found among other things that balloon tires are very effective in minimizing vertical acceleration, but that shock absorbers do not always improve riding qualities at low speeds. Some of Professor Warner's investigations revealed the fact that the period of oscillation of the body was as much as three times as long as that of the axle.

Much Work on Oil Problem Necessary

The sessions on oil dilution showed that considerable research work still will be necessary before the engineers know all they need to know about this perplexing problem. Recent investigations have revealed considerable new information, much of which was given in papers and discussions at this meeting. Neil MacCoul of the Texas Company described a series of tests on consumption and dilution of engine oil from which the following conclusions were reached:

Dilution is approximately proportional to the fuel consumed and increases as the richness of the mixture is increased and as the throttle is opened. Oil consumption varies with the speed of the pump and not in proportion to the pressure, which increases almost as the square of the speed. Change in temperature of the air entering the carburetor has little effect on dilution, but changes in temperature of crankcase and cylinder jacket have a marked effect. Power increases to some extent with increase in cylinder water temperature.

Among the improvements suggested to avoid or minimize dilution were: better distribution, use of radiator shutters, thermostats and rectifiers. It was generally agreed that considerable of sediment in combination with dilution is highly important.

Someone asked F. S. Duesenberg what effect the supercharger has on distribution and dilution. Mr. Duesenberg replied that the supercharger used in his racing car had improved distribution materially and that, because of this, its use may have some effect on dilution.

There was considerable talk both at the sessions and informally about radical changes in transmissions within the next few years. It has been recognized for a long while that the sliding gear transmission is a compromise, but up to the present time no satisfactory substitute has been developed which will fulfill the requirements of reliability in operation and low cost of production. Several new types of transmission were explained and demonstrated at this meeting, however, and there was a general feeling that very great progress has been made along this line recently. Some of the mechanisms shown were rather complicated as regards theory of construction but demonstrations showed them to work with great simplicity.

Much interest was shown in the positive mechanical continuous-torque variable-speed transmission unit made by the Weiss Engineering Corp., which was described by E. B. Sturges. This device consists of a rotor which is driven by the flywheel or, as alternative, a hollow spherical element which may be attached directly to the flywheel, also forming a portion of the rotating weight. By means of ball bearings, which form rollers which are wedged into contact with the hollow sphere, and either a universal joint or universal gearing, the speed, and, therefore, the torque, at the driven shaft may be varied by a torque governor, or at will by the operator by means of a control lever. The device can be set to transmit no rotation, to act as a brake on the rear end, and to give direct drive forward and to give a comparatively low reduction in the reverse direction.

New Constant Mesh Gearset

Another device of the continuously variable type was described by W. A. John, while W. A. McCarrell explained a new constant mesh gearset which he has developed recently. All of these innovations and the interest exhibited in them by the engineers, indicate that careful study is being given to transmissions at the present time and that important developments along this line will not be surprising within the next few years.

Disagreement arose among the engineers about what constitutes an ideal air cleaner and as to what types of road dust and carbon harm the engine. It was generally agreed, however, that engine durability and performance is increased by keeping out of it dust and dirt and that material progress is being made in the design of devices capable of performing this function in a commercially practicable manner.

Develops Million Dollar Parking Business

City Congestion Opens Up Opportunity for Profit in Providing Open Lot Storage Space for Passenger Cars

IN every metropolitan city in the United States parking privileges on downtown streets are becoming more and more restricted, and in many instances completely eliminated. Traffic congestion, authorities declare, will eventually demand complete open spaces for the free movement of traffic on main business arteries. With the number of automobiles used in business, and by women shoppers, on the increase, the demand for parking or storage facilities is assuming greater and greater proportions, and in some cities is resulting in the development of a phase of automotive service that until recently has for the most part been operated in a haphazard manner. Reference is made to open lot parking.

Los Angeles, with an average increase in population of 100,000 people a year during the past five years, and a resultant increase in traffic congestion, claims a very interesting organization that has made a remarkable success of open lot parking. This organization is headed by Andrew Pansini, who is known as the "Automobile Parking King" of Los Angeles. Mr. Pansini operates under the name of the "Savoy Auto Park System" 24 open parking lots and two garages, besides several service stations. On an average of 4000 cars are handled in his parking lots every twenty-four hours, or approximately 120,000 a month.

The open lot parking business in Los Angeles has been placed on a very efficient basis by Mr. Pansini, because he is convinced that it is a business that will endure as long as automobiles are operated. And he declares that operators of parking establishments such as he conducts can successfully compete against business establishments for choice space. A two story brick building was planned on a location adjoining one of Los Angeles' largest department stores some months ago. The company planning to

erect the building still had under consideration the terms for the lease demanded by the owner when Mr. Pansini stepped up and promptly signed the lease asked, agreeing to pay a rental of \$2,200 a month for a number of years. The lot has a total capacity of 150 cars, but as many customers only park their machines for a short period of time, the daily average for this parking establishment approximates 300 cars, at a charge of 35 cents each.

tendants, rather than by their owners.

Mr. Pansini says that the choicest locations where payment of what might appear to be unusually heavy rent is justified are those so situated as to catch the trade of women shoppers. While many business men will drive down to their office and leave their car parked in a stall throughout the day, the stay of the woman shopper's car is comparatively brief, thus causing space to be continually opened up throughout the day for new business.

While under Mr. Pansini's system a patron may drive in and out of one of his lots as many times as is desired during a day without any extra charge. It is his experience that this privilege is taken advantage of only by a comparatively small number of his customers.

Mr. Pansini's rise to a position where he could now retire, if he choosed to do so, an independently wealthy man, has followed a most interesting career. A few years ago he left a small town in New Jersey, an involuntary bankrupt. His first work in Los Angeles

was driving a milk wagon, his original occupation. Savings from his wages were used to purchase a second-hand automobile, which he operated as a taxicab. His first venture in open lot parking was fraught with many difficulties, and he was forced to open a shoe shining stand in one front corner of the lot and personally shine shoes to help meet the rent. He kept plugging on, and as traffic increased, his business increased.

From his humble beginning, Mr. Pansini in four years has developed his system of parking lots to its present proportions. A combination shoe shining artist and open parking lot operator a few years ago, today he has his signature affixed to leases that call for the aggregate payment of nearly \$750,000—three-quarters of a million dollars—and virtually all of these leases are for open parking lots.



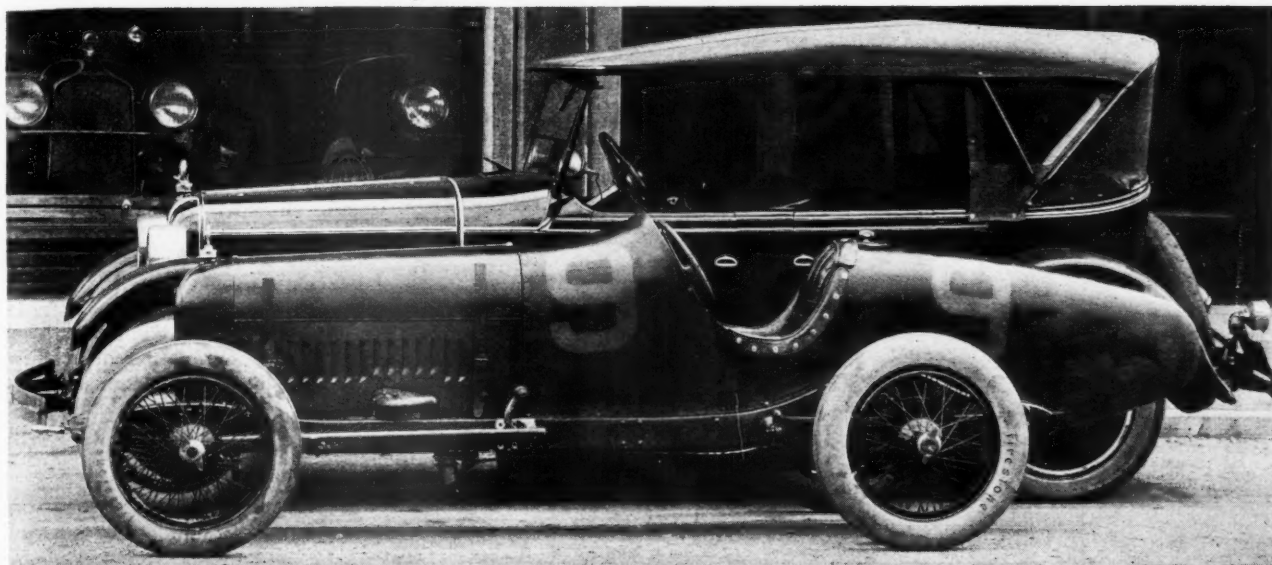
Open lot parking space for which the operator pays \$2200 a month rent. Insert, Andrew Pansini, proprietor of million dollar parking business

All of the space controlled by Mr. Pansini is under long lease. He has refused to occupy any ground on a temporary basis, as many operators of open parking lots do. He is building a strong permanent foundation under his business.

Thirty-five cents is the maximum charge and ten cents the minimum in the Savoy Auto Park system. The rates vary according to location of the lots. All of Mr. Pansini's lots are either near the very heart of the downtown business section, or at the edge, with few exceptions.

A Highly Developed Service

Mr. Pansini offers a very highly developed service to his customers. Responsibility is assumed for damage to any car left in his care, that may be due to the carelessness or negligence of employees. All cars are parked by at-



The Duesenberg Special Racing Car placed alongside one of the stock Duesenberg cars for comparison

Comparing Race Car Design With Commercial Practice

Smaller and More Efficient Engines. Racing Cars Not Always the Highly Specialized Creations as Generally Believed. Lighter and Stronger Parts Developed Through Racing

BY B. M. IKERT

BY a constant process of eliminating certain constructions and substituting for them others, race cars have been made lighter, faster, easier riding and endowed with a greater factor of safety. This was forcibly illustrated in the last 500-mile Indianapolis race when it is recalled that the first five of the 122 cu. in. piston displacement cars finished at greater speeds than the old record of 94.48 m. p. h. The new record is 98.24 m. p. h. and the outstanding feature of the race aside from the smashing of all records is that the victorious cars had no mechanical troubles to speak of and came through the race in excellent shape.

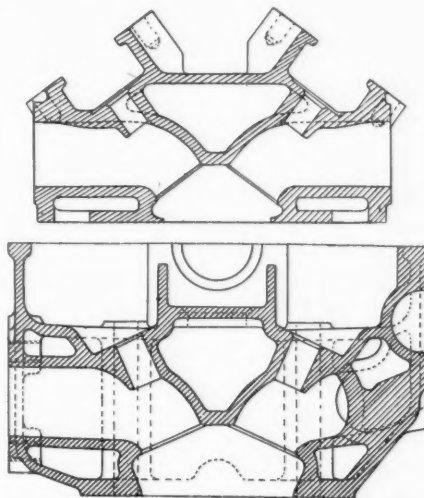
The results of the race showed that these small cars were not only the fastest but also the most reliable group of cars that ever raced over the Hoosier oval. Much of this reliability has been secured by proper weight distribution and strength in the chassis learned from past experience in racing.

Not Built in a Week or Month

No racing car of any consequence is built in a week or a month. Years of experimenting and many failures are responsible for the great performance of the cars which competed in this year's 500-mile race. Countless constructions have been tried in the past and abandoned

and each year, although the piston displacement of the engines has become smaller, and speed of the cars have been greater.

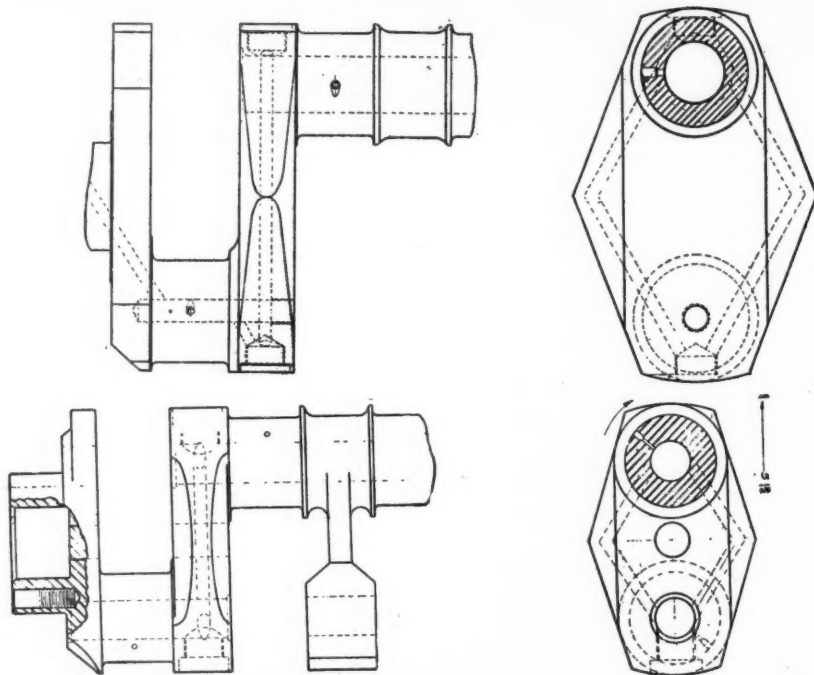
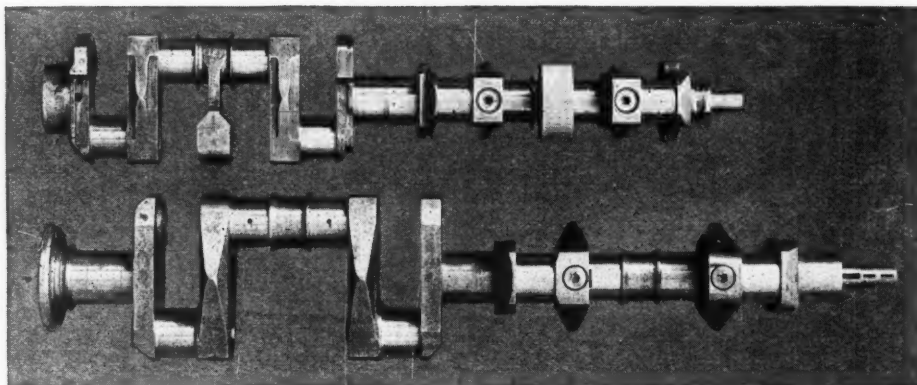
It is unfortunate when a racing car smashes and yet the wrecks very often have furnished the best material from which new designs can be molded. By



Sectional views of the Duesenberg racing engine head and that of the stock car, showing the similarity of the design. The racing engine has two camshafts, whereas the stock engine has one

carefully going over a wrecked racing car the cause of the accident may be revealed, unless it was caused by some action of the driver and is obvious. But in the case of a very badly damaged car it is difficult to ascertain the exact cause some times. It may have been a flaw in the metal of some part or some part which may have been hurriedly put in was not heat treated sufficiently.

There were few mechanical failures in this year's cars which ran in the 500-mile race. Troubles seem to become less common as time goes on and designers and builders of racing cars develop new things and as the makers of steels and alloys develop new metals which are lighter and stronger. In the old days of racing and also in commercial building of motor vehicles if a part broke the common practice was to make it heavier. And even today in some of our stock cars parts are heavier very often than necessary because of the inability of the car makers to get metals which run uniform. Several car builders have made the statement that it would be possible to make their cars lighter in some respects, reducing the unsprung weight, etc., if it were possible to get the right material. In racing cars it has been possible to get the right material, because of the unusual efforts put forth on the part of the builders and also be-



Details of the crankshafts used in the Duesenberg racing and stock cars. The smaller shaft is that of the racing car

cause no expense is spared to go the limit in getting what is desired. This has made possible lighter parts for race cars and yet parts which are considerably stronger. There will, no doubt, be much of the same thing in our commercial practices in the next few years and, in fact, there is some of it now in evidence to some extent in stock cars.

A Difficult Thing to Figure

Just how much of what has been accomplished on the race track is reflected in stock car design and construction is a rather difficult thing to figure, but an excellent opportunity is afforded this year to make a direct comparison of the 122 cu. in. Duesenberg Special car, which won this year's race and the stock car of the same name and make which has a piston displacement of 260 cu. in.

After making a thorough and almost piece by piece analysis of the constructions and units incorporated in the present Duesenberg stock chassis and that of the racing car, it can be said without contradiction that the race car chassis is about 75 per cent stock.

The greatest outstanding difference in

the two is that the race car is smaller, this being necessary on account of the 122 cu. in. piston displacement restriction, and the 1,450-pound weight limit which means that the weight of all parts must be kept to a minimum.

When we make the statement that about 75 per cent of the race car is stock we do not mean that the majority of parts are interchangeable with the stock car, but we do mean that stock forgings are used in a great many instances these being simply machined smaller to meet the weight restrictions of the 122 cu. in. race car. It must be understood for one thing that the stock car has a 134 in. wheelbase while that of the race car is but 100 in. This naturally means a shortening up of the drive shaft and other units, but basically the method of drive and the layout of the units in both chassis are the same. Reference to the photographs and blueprint reproductions will bear out the latter statement.

Naturally in the race car several things had to be done to get the utmost in speed and stamina. These are the two qualities sought by the race car builder and in their attainment things

are often done which would not be necessary in a stock car. The use of a supercharger, for instance, added considerable to the performance of the small 122 cu. in. engine used in some of the Duesenberg race cars this year. When these small engines reach 4,000 r. p. m. the supercharger becomes very effective, this being shown by the fact that they have reached a speed of 5,200 r. p. m. without loss of power. Thus, as it becomes necessary to speed up the small engines the use of the supercharger is quite effective, but for commercial purposes and with stock engines of over twice 122 cu. in. piston displacement, the supercharger is not as yet deemed very essential by most designers and builders of engines and cars.

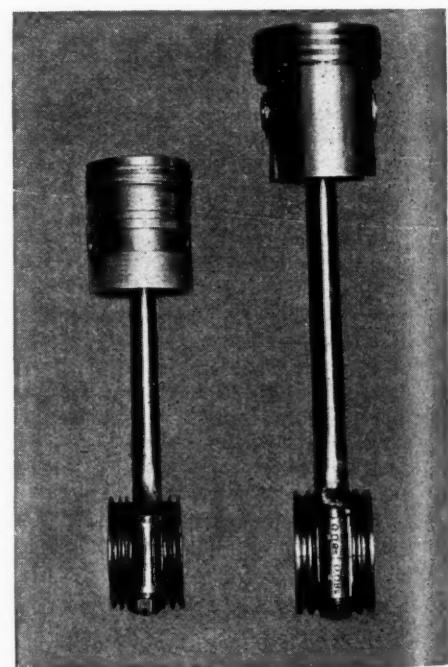
Speed and Stamina

Speed and stamina are two of the things which the Duesenberg Automobile & Motors Co. has sought to build into its stock car. The Duesenberg car appeals strongest, perhaps, to a class of buyers who seek high sustained road speeds. And as such the car must necessarily have the qualities to "stay put" over all kinds of road conditions just as the race car must be able to stand up under the terrific strain of racing.

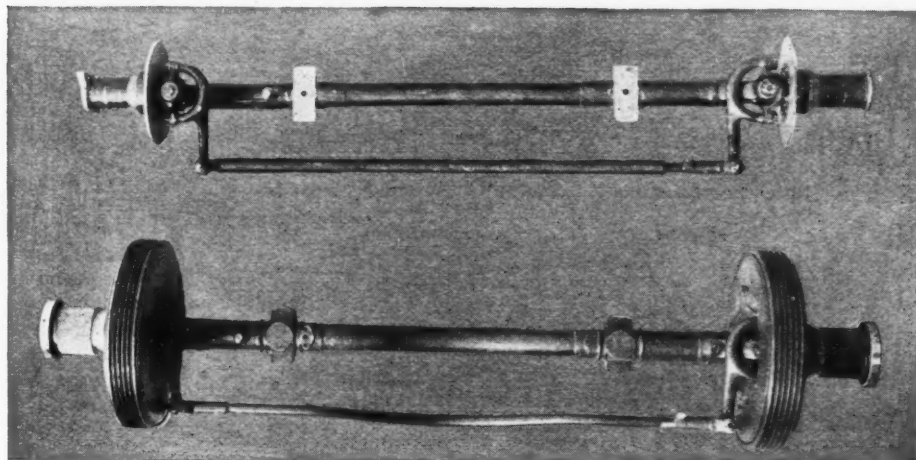
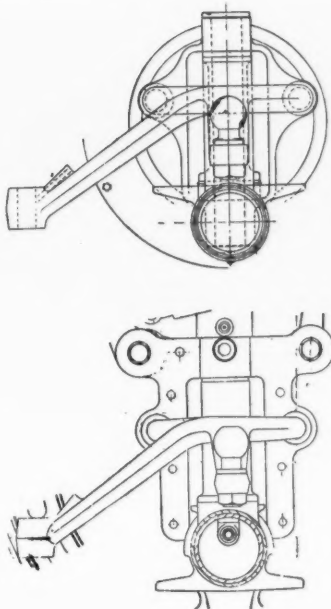
It is but natural therefore, that a concern building both race and stock cars should incorporate certain design and constructional features in each type of car, which it has found from experience give the desired results.

To give some idea of the dove-tailing of the efforts on each type of car the experience which Fred and August Duesenberg have had with rear axles is cited.

Back in 1913 one of the drivers of the Duesenberg race cars broke five rear



At the left is the piston and connecting rod assembly of the Duesenberg racing car, while the other is that of the stock car. Both rods are tubular and carry cooling flanges



As shown here the front axle layout of the Duesenberg racing and stock cars are very much the same. In fact, the steering arms and several of the other forgings are exactly the same. The essential difference is that the brakes are eliminated from the front axle of the racing car

axles during the season. During the winter months following the Duesenberg brothers and their assistants started in to revamp the axles which had been bought on the open market from the axle makers "as is." The axles had been changed by the Duesenbergs in several respects to adapt them for racing, but they still were far from satisfactory. The process of revamping has been going on steadily until an axle has been obtained which is lighter in weight and which meets all the requirements of racing. One has only to recall that axle troubles, in fact, trouble of any kind rarely develops in the various units of the chassis with the exception of the engine wherein the parts are so much more highly stressed.

The Duesenberg brothers attribute this lack of trouble largely to the design and light weight of the parts. Incidentally getting the weight of a unit like the rear axle down materially reduces the tendency for slippage at high speeds, to say nothing of the easier riding and handling of the car by virtue of less unsprung weight.

How this is reflected in the stock Duesenberg car is shown by the fact that the rear axle weighs about one-quarter less than axles of cars in the same weight class. In addition Mr. Duesenberg states that owing to the construction of the axle, which has been developed side by side with the racing car axle, it is 30 per cent stronger than stock axles called upon to meet the same conditions. It is interesting at this point

to know that no Duesenberg stock car has as yet encountered any difficulties in the way of rear axle breakage.

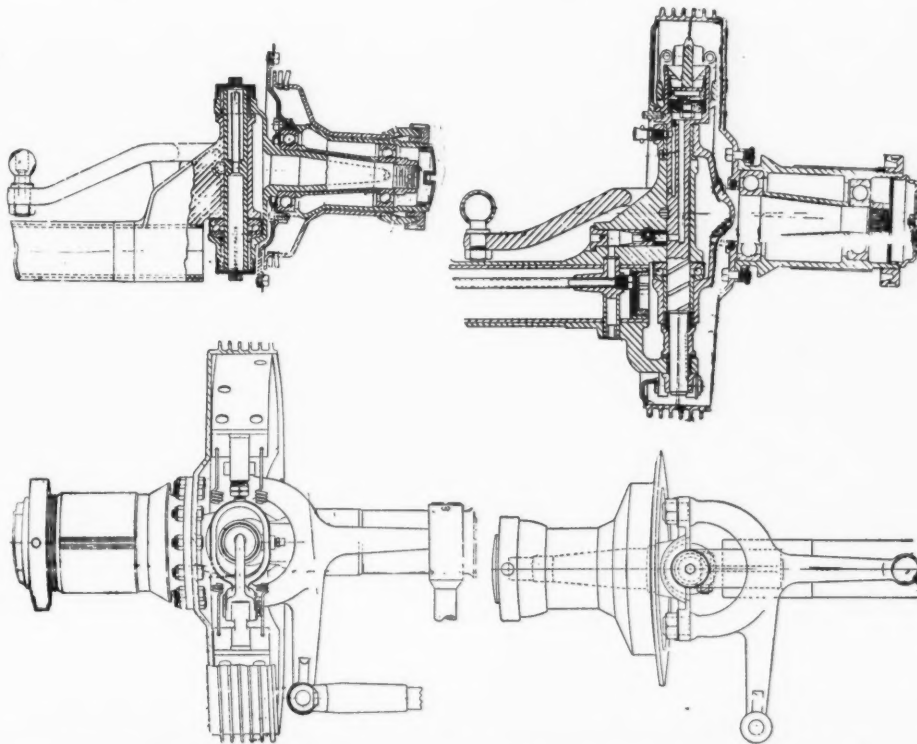
In making the comparison of the Duesenberg race car and stock car, we find some difference in the engine design, this difference being largely justified in the endeavor to get down the weight. For example, the race engine has an aluminum block in which are fitted eight steel sleeves serving as cylinder bores, whereas the stock engine block is cast iron and without sleeves.

The race car engine has two overhead camshafts, these being driven by a chain of gears at the front end. In the stock engine, which incidentally has a piston displacement of 260 cu. in. there is a single overhead camshaft, the latter being driven by a vertical shaft and bevel gears. It is quite evident that two camshafts overhead can be driven with less complications by spur gears than would be the case if a vertical shaft were employed.

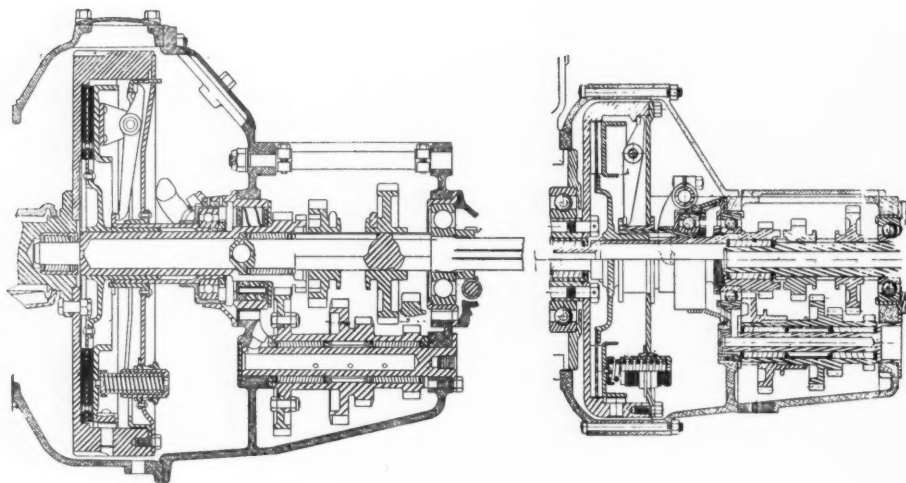
Same System for Both

In the matter of lubricating the engines the most interesting thing is that the same system is used for both. The only difference is that in the case of the stock engine the oil enters the crankshaft at three points, whereas it enters at one point in the race engine. Thus relatively speaking, it might be said that the stock car engine, in a sense, is even better oiled than the race car engine. The oil pumps are identical. About the only difference in the oiling system outside of the method of taking in the oil in the crankshafts is that in the stock engine there is a cored passage for the oil in the front end of the cylinder block which carries the lubricant to the overhead camshaft, while in the race engine an exterior tube does the same thing. Both engines are oiled substantially as follows:

The oil after being forced through the crankshaft enters the connecting rod bearings. Another line leads from the pump up to the hollow camshaft entering the latter at the forward bearing.



Above are sectional views of the front axle king pin layout on the racing and stock Duesenberg axle. The other two views show the duplication of steering arms



The transmission and clutch layout are practically the same. The clutch and transmission of the stock car is shown at the left. Aside from being smaller the racing car transmission differs from the other in that the countershaft gear is thrown out of mesh when in high gear

ing. All of the camshaft bearings are oiled through holes drilled in the camshaft. In the stock engine the oil is forced from the same source in the front bearing of the camshaft through the hollow rocker shaft, which also is drilled in order to lubricate the rocker arm bearings. The oil passes through these bearings onto the cylinder head, drains into a trough lubricating the cams and rocker arm rollers in a bath of oil. From

there it drains into the head and back into the crankcase, at the forward end passing over the bevel gears on the vertical driveshaft, while at the rear it passes through a tube.

The race car engine is lubricated in practically the same way excepting that modifications have to be used for oiling the ball bearings supporting the crankshaft at the front and rear end. The overhead camshaft gears and drive gears

are oiled in precisely the same manner as the vertical shaft gears of the stock engine.

The oil pump of the stock engine revolves at engine speed, while that of the race engine revolves at one-half engine speed. However, since the race car engine turns over much faster than the stock engine the speeds of the pumps is about the same.

Excepting for size both crankshafts are laid out the same way. The cheeks of the throws are the same as will be noted from the illustrations. Both shafts are carried on three bearings, these being plain babbitt lined bronze backed bearings in the stock engine while ball bearings are used in the race car engine for the front and rear only, the center being a plain bearing.

Some difference occurs in the crankshafts as to the method of attaching the flywheel, this being necessary owing to the use of a ball bearing for the rear bearing in the race engine. There is, therefore, no flange on the end of the crankshaft of this engine and the cap screws holding the flywheel are inserted directly into the end of the shaft which forms the seat for the inner race of the ball bearing. The stock engine uses a flange on the shaft as in conventional practice.

Cooling by Pump System

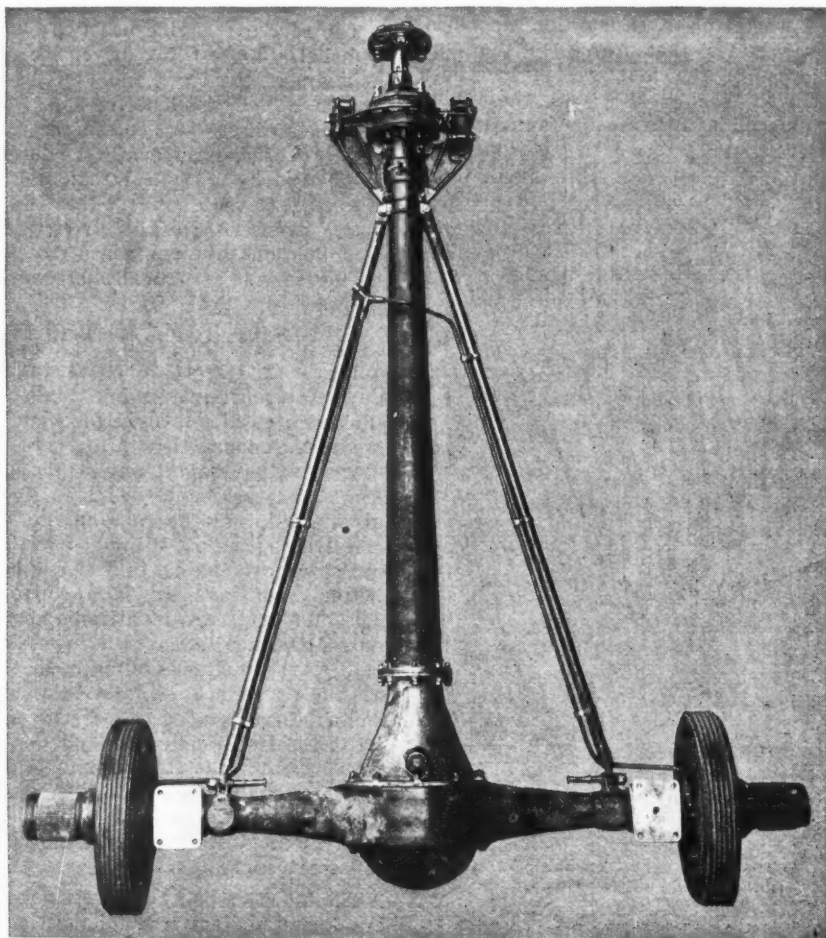
Cooling in both cases is by a pump system, the pumps being exactly the same for each engine. The cores in the radiators are identical excepting that the one in the race car is smaller. What has been said in a preceding paragraph regarding the speeds of the oil pumps on the two engines applies equally well to the water pumps, the latter being driven at the same speeds in each case as with the oil pumps.

Both engines are three point suspended in the frame and the method of installation is practically identical.

The illustrations of the rear axle used on the stock and that of the race car show the similarity of the two. Both axles are of the semi-floating type and everything has been done to get them as strong and light as possible. In both cases the axle shafts are tubular with integral hubs. The hub end of the shafts is supported in a ball bearing while the inner end is attached to the side gear in the differential by splines.

The differential layout is practically the same in both axles and the manner of mounting on ball bearings is identical. The ring gear carrier of the racing axle, while smaller, is made from a stock part and the ring gear is bolted to the carrier while in the stock car it is riveted. The stock axle also is provided with an adjustment for getting the proper mesh of the ring gear and pinion, while there is no adjustment in the race car axle.

Both the pinion shaft of the race car and stock car are mounted on ball bearings in the same manner, with the exception that a double row type of bearing is used in the stock car. Both pinion

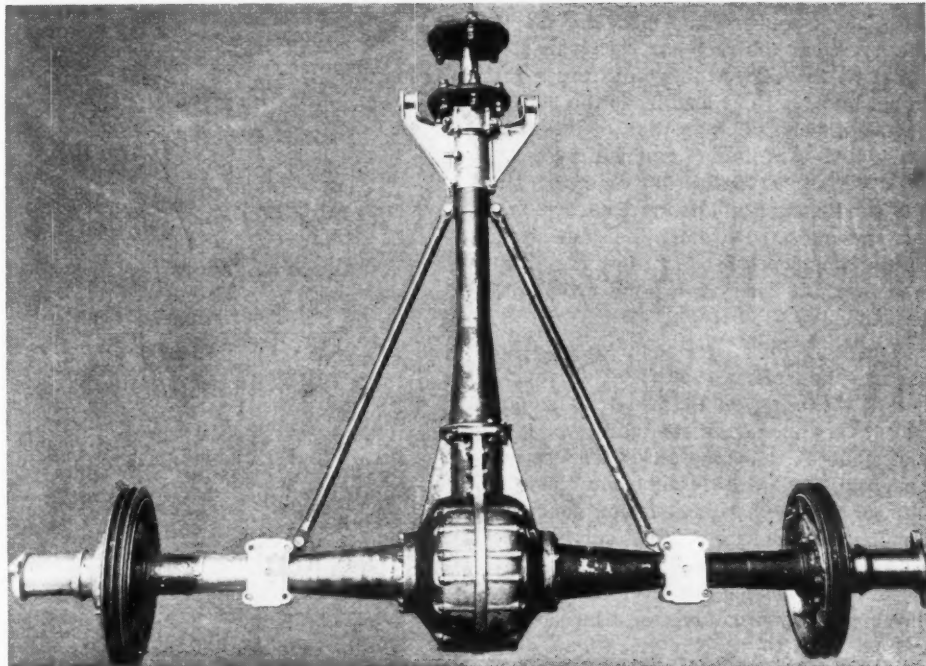


Here is shown the stock Duesenberg rear axle together with the torque tube, torque tube yoke, and the double universal joint

shafts are hollow to save weight and in the race car the shaft is made with splines on the inside, whereas the splines are on the outside in the stock car pinion shaft. A spacer of the same type is used between the two bearings of both pinion shafts in both cars.

Both Axles Employ Radius Rods

Both rear axles employ radius rods and driving and braking reaction is through a torque tube which is flange mounted to the rear axle housing in the same manner in both cars. The yoke at the forward end of the torque tube is practically the same in each case differing chiefly in the material used, that of the race car being an aluminum alloy while steel is used in the stock car. Reference to the illustrations of the two axles shows also that the universal joint layout is identical, there being two in each case. About the only difference here is that in the race car the propeller shaft brake is placed behind the transmission while on the stock car it is incorporated within the yoke of the torque tube. The housings for the rear axles differ chiefly in that the one of



By comparing this view of the Duesenberg racing car axle with that of the stock axle on the preceding page, similarity of design will be noticed

the race car is built-up housing, while a banjo type is used for the stock rear axle.

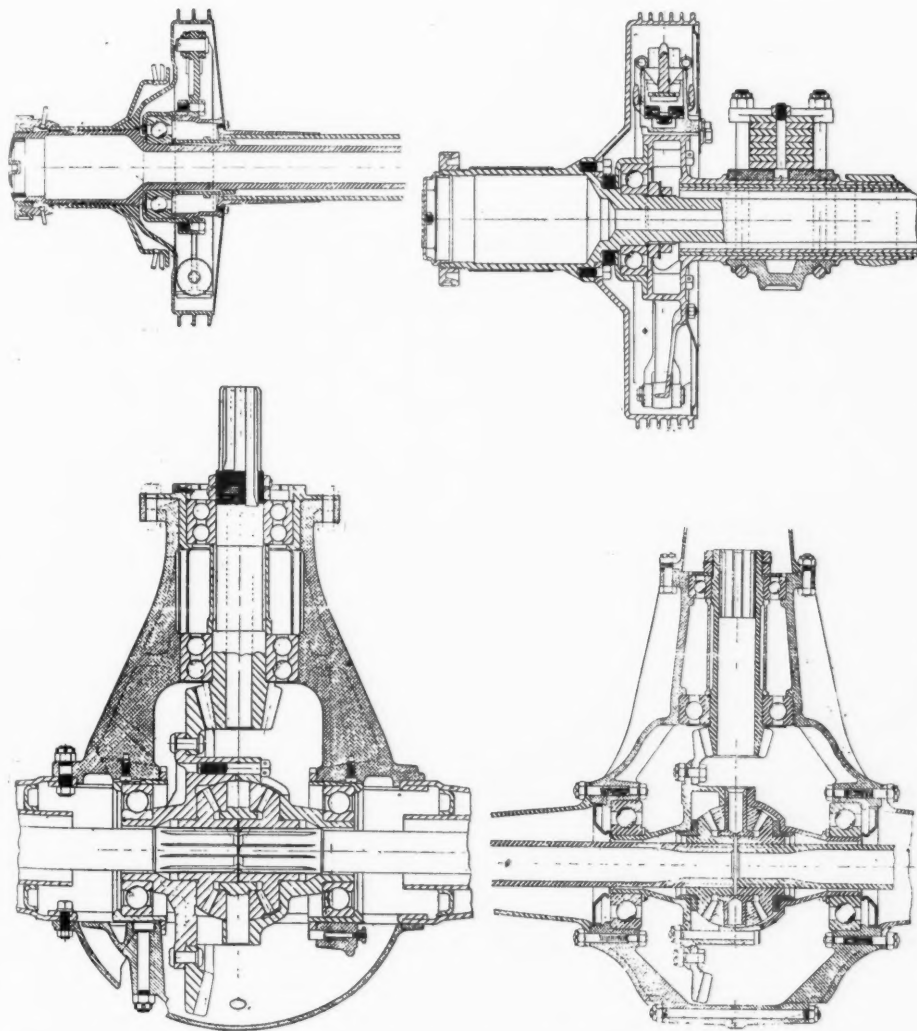
Coming to the front axle we find an absolute duplication in the steering arms, as shown by the accompanying illustrations. The Duesenberg racing cars of this year used stock forgings for these parts and the ends of the axle tube supporting the knuckles are stock parts machined down a little smaller. The wheel bearing layout is the same in both front axles even to the thrust bearing of the king pins. The race car is not equipped with brakes on the front wheels and consequently the layout of the stock axle which carries hydraulically-operated brakes is somewhat different to provide for the extra mechanism.

Excepting for size the clutch and transmission layout of the racing car and stock car are the same. As in many of the other units, we find that some of the clutch parts are made from stock parts machined smaller. An example of this is the clutch driving hub. Both clutches are of the dry plate type and reference to the sectional views shows the similarity of the disengaging levers, clutch pilot bearing, release bearing, etc.

Transmissions Designed on Same Lines

The transmissions are designed along the same lines and outside of the difference in size about the only way they differ is that in the racing car the large countershaft gear or what is commonly called the constant mesh gear is thrown out of engagement when the shifting lever is high gear. Thus the countershaft of the racing car transmission is stationary when the car is in high gear. This is shown in the sectional drawing.

Hydraulically operated brakes using the same general layout are used on



Sectional views of the differentials and axle ends of the Duesenberg stock and racing cars. This shows the similarity of design, particularly in the tubular axle construction. In both instances the differential casing is made of drop forgings instead of castings. The racing axle is, of course, smaller than the stock axle and many of the parts used in the former are stock parts machined smaller

both stock and racing models. As in the stock car the race car uses a master cylinder, the piston of which forces the liquid into the lines leading to the brakes on the wheels. The position of the master cylinder of the racing car is a little different from that of the stock car, but fundamentally the systems are laid out and operated exactly the same way, the only exception being that the front wheels of the race car are not fitted with brakes.

Excepting for a few modifications for racing, the steering gear of the racing car is the same as in the stock model. Both gears are of the cam and lever type and made by the same maker. There are no spark and throttle tubes in the column of the racing car steering gear and to eliminate shocks the column is fitted with an insulating device of clever design. This device replaces the fabric disk formerly used on the Duesenberg racing cars to absorb vibration. The drag link of the racing car also is longer than that of the stock model.

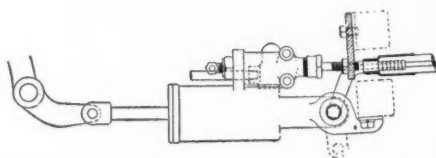
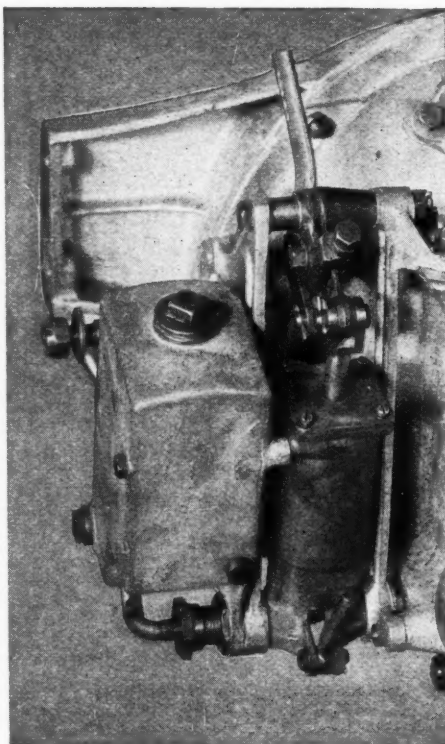
Semi-Elliptic Springs

Both the racing car and the stock car are fitted with semi-elliptic springs, the springs of the racing car, of course, being smaller. They also are attached to the side of the frame whereas in the stock car they are attached directly under the frame side rails.

Some of the Duesenberg racing cars are fitted with the conventional form of spring shackles while others have rubber shock insulators, a practice which has worked out so well on the racing car, that they no doubt will be incorporated in the stock car in the future.

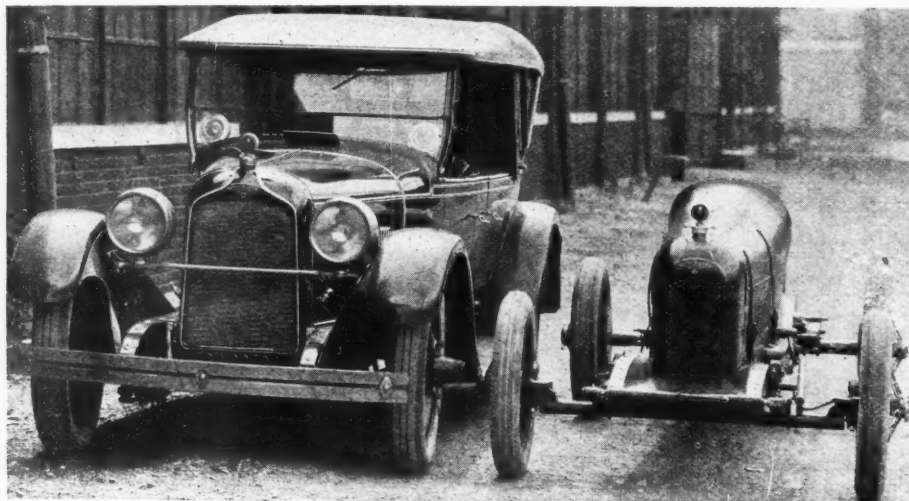
The frames have little in common, due chiefly to the entirely different requirements. To get the racing car low the front of the frame is kicked up over the axle and to get light weight the frame is made of Duralumin.

Even in general looks the racing car



Hydraulically operated brakes are used on both the racing and stock Duesenberg cars, the only difference being in the position of the Master cylinder, the latter being placed horizontally instead of vertically in the race car

and stock car have something in common. One has but to get them alongside each other to appreciate this. The radiator and hood lines are very much the same and if one placed a racing type body on the stock model the racing car alongside it would look very much like a vest pocket edition of the former.



Equipped with top and fenders the Duesenberg 122-cu. in. race car would look very much like a vest pocket edition of the stock car

Omnibus Corporation Plans Large Program of Expansion

Transfer of 51 Per Cent of New York Stock by August Will Complete Merger

NEW YORK, July 7.—The merging of two of the greatest bus transportation lines in the country—Chicago and New York—has been practically consummated in the formation of the Omnibus Corporation, headed by the Hertz interests, and announced last week. It needs only the transfer of 51 per cent of the New York stock by the first of August to ratify the deal arranged by the banking houses of J. & W. Seligman & Co. and G. M-P. Murphy & Co. That, it is said, is practically assured now.

The Fifth Avenue Bus Securities Corp., the New York Transportation Co. and the Chicago Motor Coach Corp. are the ones involved in the merger and which will be brought together in the Omnibus Corp., which will be the holding company. The Fifth Avenue Bus Securities Corp. now owns more than a majority of the stock of the New York Transportation Co., which in turn owns the entire capital stock of the Fifth Avenue Coach Co. and manufactures buses for use by its subsidiaries and for sale to others. The Fifth Avenue Coach Co. owns and operates bus lines in New York. The third partner, the Chicago Motor Coach Corp., owns the stock of the Chicago Motor Coach Co., the latter owning and operating bus lines in Chicago and Cook County, Ill.

Unification, recapitalization and reorganization of these three units under the name of the Omnibus Corp. will permit of later expansion all over the country. New York and Chicago will be the national demonstration fields, where ideal bus service will be installed. Later, the Omnibus Corp. will expand with bus lines in places where the demand for them is apparent, its policy being to co-operate with and supplementing existing transportation companies.

Personnel of Board

John Hertz, chairman of the board of the Chicago Motor Coach Corp., and John A. Ritchie, now president of that corporation and formerly president of the Fifth Avenue Coach Co., will serve as chairman of the board and president, respectively, of the Omnibus Corp. The board will include John Hertz, Charles A. McCulloch, John A. Ritchie, Leonard S. Florsheim, W. Rufus Abbott, Otto W. Lehmann, John Borden, John R. Thompson, William Wrigley, Jr., and Edward N. D'Ancona, all present directors of the Chicago Motor Coach Corp., and Grayson M-P. Murphy, Charles H. Sabin, Albert Strauss, Harold E. Foreman, George A. Green, Harvey T. Woodruff, James B. A. Fosburgh, John C. Jay, Emanuel Lascaris and Edmond E. Wise.

How Dodge Bros. Teach Public Used Car Values

Poster in Dealers' Salesrooms Shows That Handling and Reconditioning Costs Must Be Deducted From Selling Value to Determine Trading Allowance

FIFTEEN per cent is set by Dodge Brothers as a necessary allowance for dealers to figure as the cost of handling of used cars, this to be deducted together with cost of reconditioning from the sales value of car offered in trade, the balance representing the actual value or allowance in making a deal. This method of appraisal is urged by the company in a special used car educational campaign now under way which, while directed specifically toward dealers, also provides for bringing home the point of view to prospective buyers.

Six Pieces of Literature

The whole campaign has been reduced to six pieces of literature, two of which are for display in the sales rooms of dealers, the others to be studied by dealers and salesmen. Two of the pieces, entitled "Used Car Common Sense," are in both pocket and poster size and are intended alike for the guidance of the seller and the buyer. One of the other pieces, "Information on Used Car Values," is recommended also for study by both seller and buyer, and dealers are advised to have patrons read it.

On its "Used Car Common Sense" poster the company says:

No used car buyer will be asked to pay more for any used car than it is worth. No new car buyer will be offered less on appraisal for his used car than it is worth.

The actual market value of a used car depends entirely on its make, appearance, mechanical condition and the demand based upon the reputation of that make of car.

All used cars will be purchased by us for cash or taken in as part payment on new cars only as outlined in the following example:

A. We will assume that the sales value of a certain used car in marketable condition is six hundred dollars.

B. From this figure we shall deduct fifteen per cent as follows: Five per cent for commission; five per cent for overhead, including rent, light, insurance, etc., and five per cent for advertising, guarantee on used car to buyer, and interest on money invested; total, \$90.

C. Experience has shown that it costs about \$84 to recondition thoroughly a car of this model in this condition. This amount is determined for each car by a careful appraisal made by a technical expert who knows the cost of the work required. This may include overhauling the engine or other units, replacing worn bushings in the chassis, repainting the body, dressing the top, replacing tires, or any other work necessary in order that we may indorse it as a reliable used car—\$84.

D. It is quite evident that the actual value of a used car or the allowance price must be obtained by deducting the sum of B plus C from A which is \$426.

Our method of figuring used car values is based on long experience in buying and selling used cars and is eminently fair to everyone concerned. The owner receives a fair price and the used car buyers receives a thoroughly reconditioned car which we can endorse as sound value.

Any owner who wishes to take the time and incur the expense of advertising his car, to make five or ten demonstrations, perhaps remaining at home evenings to do this, to take notes for seventy per cent of the price, can, after spending the money necessary to put the car in condition demanded by the buying public, sell his car at the same price as we ask.

Remember, that it is easy to get a higher allowance for a used car than it is worth by trading it in on a new car which carries an inflated selling price.

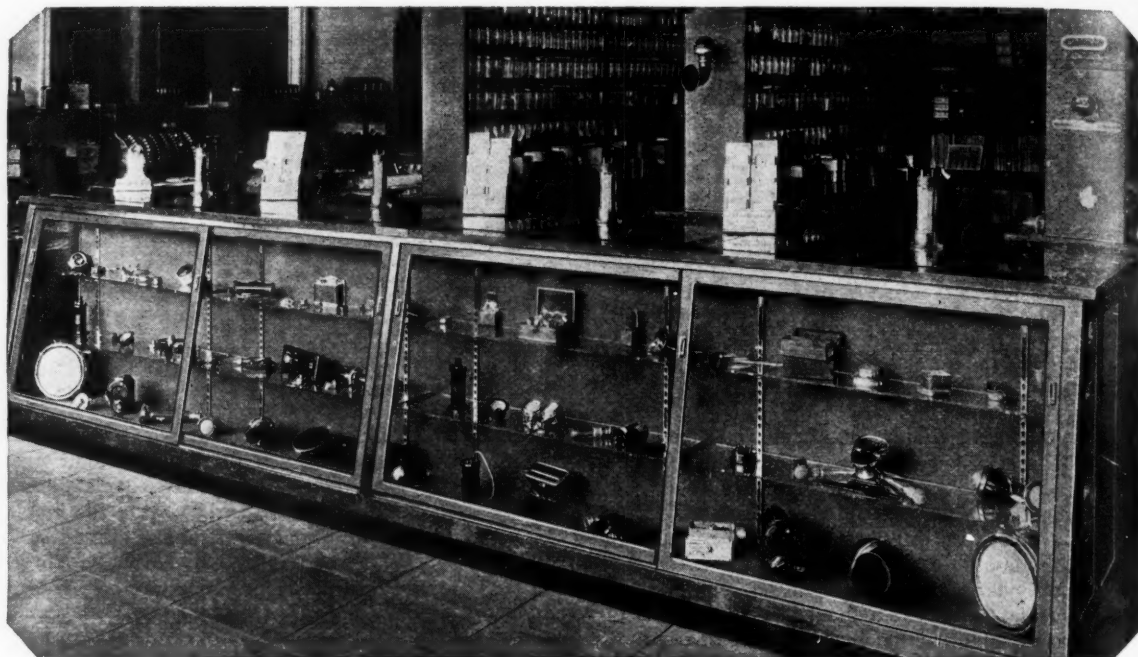
Dodge Brothers Motor car list prices are not inflated to cover used car allowances, but do reflect only true value.

We cordially solicit your business on the basis outlined above. By adhering to these policies we protect our good name and assure you honest treatment and continued good service.

Some Mail Literature

As part of the campaign is some direct by mail literature which the dealer may obtain from the factory and which goes to the prospective customer picturing some reconditioned Dodge Brothers models which may be purchased and also setting forth reasons why cars are traded in by original owners and why these cars offer excellent investments for buyers. Suggestions for used car advertising are also given to dealers, these being reprints of successful campaigns conducted by a number of Dodge Brothers dealers in the past two years.

Display Does Make a Difference



AN orderly and attractive display of accessories and automotive equipment helps increase sales.

A large volume of automotive buying is done by men, and men dislike to ask for articles of merchandise to be shown to them. They prefer to pick up the article they want, or point it out to the salesman, and say, "I'll take this."

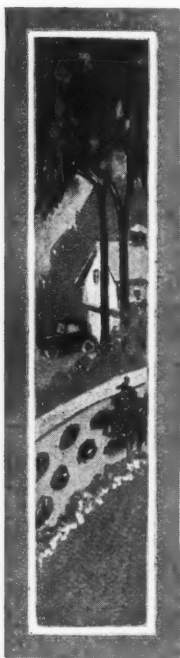
They like to see the price in plain figures right on the merchandise. When they see an article plainly marked they never quibble about the price.

The popularity of the self service grocery stores is proof

Automotive Customers Like to See

of the selling power of plainly marked merchandise within reach of the customer's hand. Among the customers of such stores are found many men who could hardly be induced to enter an ordinary grocery. Further proof is found in the five and ten cent stores where great throngs of both men and women are constantly exchanging their nickels and dimes for plainly marked and visible merchandise.

Store equipment for the proper display and storing of automotive merchandise serves two purposes: First, it



The photograph at the top of this page shows the salesroom of Harry T. Kidder, 2435 N. Broad street, Philadelphia, Pa., after installing a display case especially designed for automotive accessories. Below, the same salesroom before the installation.

Proved by "Before" and "After" Photos



the Merchandise That They Buy

gives the customer an incentive to buy because he sees many items that he might not otherwise think of; and, second, it enables the merchant to keep a closer account of his inventory. It also saves time in the completion of a sale, for the salesman knows where to find an article and does not waste time hunting for it.

The photographs on these pages show what can be accomplished by the installation of the proper display equipment and the use of some care in the arrangement of articles in the display cabinet and on the stock shelves.

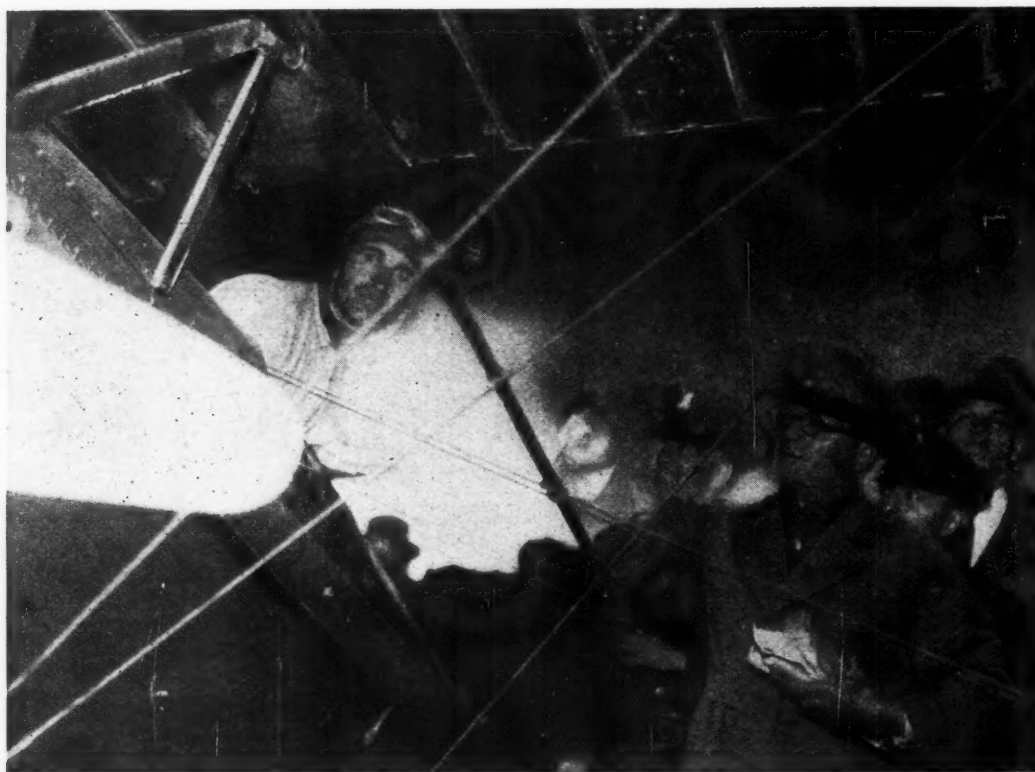
The display cases used here have compartments in the back in which there are drawers for the storage of small articles. The proper arrangement and indexing of the contents of these drawers facilitates the delivery of articles requested by the customer. The display side of the cabinet is so arranged that it lets in lots of light, making the articles plainly visible. This also makes it possible to obtain good results from the price marking of all articles.

We are indebted for these photographs to the Sherer Gillett Co., Chicago, manufacturers of the display cases illustrated in the "after" photographs.



At the top of this page is a photograph of the salesroom of Nathan E. Packard, Brockton, Mass., after the installation of a display case designed especially for showing automotive accessories. Below, the same store before the installation.

MOTOR AGE'S PICTURE PAGES



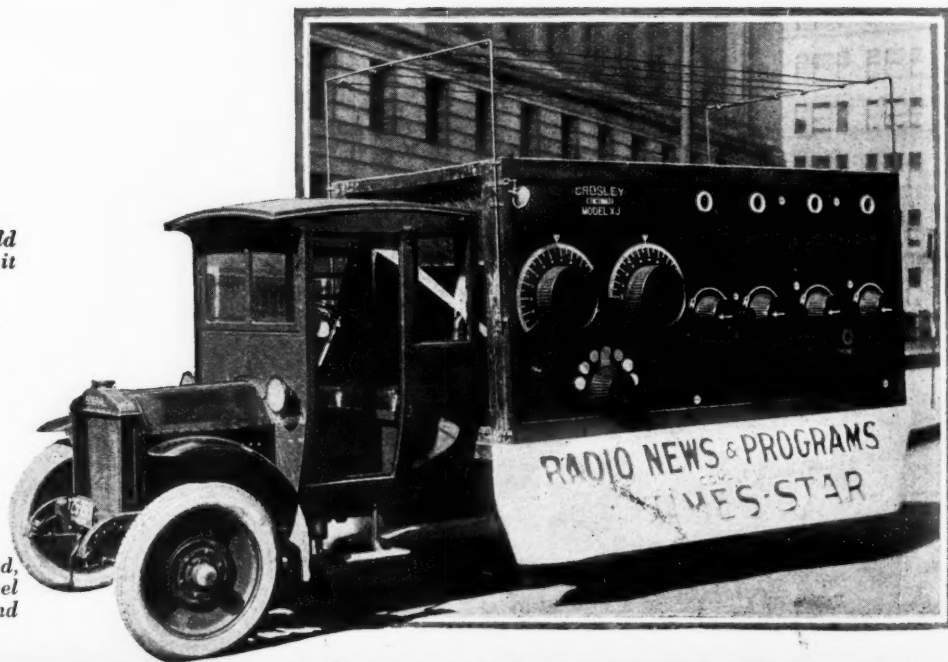
Lieut. Maughan arrives at the Golden Gate after his history-making coast-to-coast flight in 21 hours and 47 minutes. Lieut. Maughan is climbing out of the plane



The largest radio receiving set in the world is mounted on this Federal truck—yes, it really works



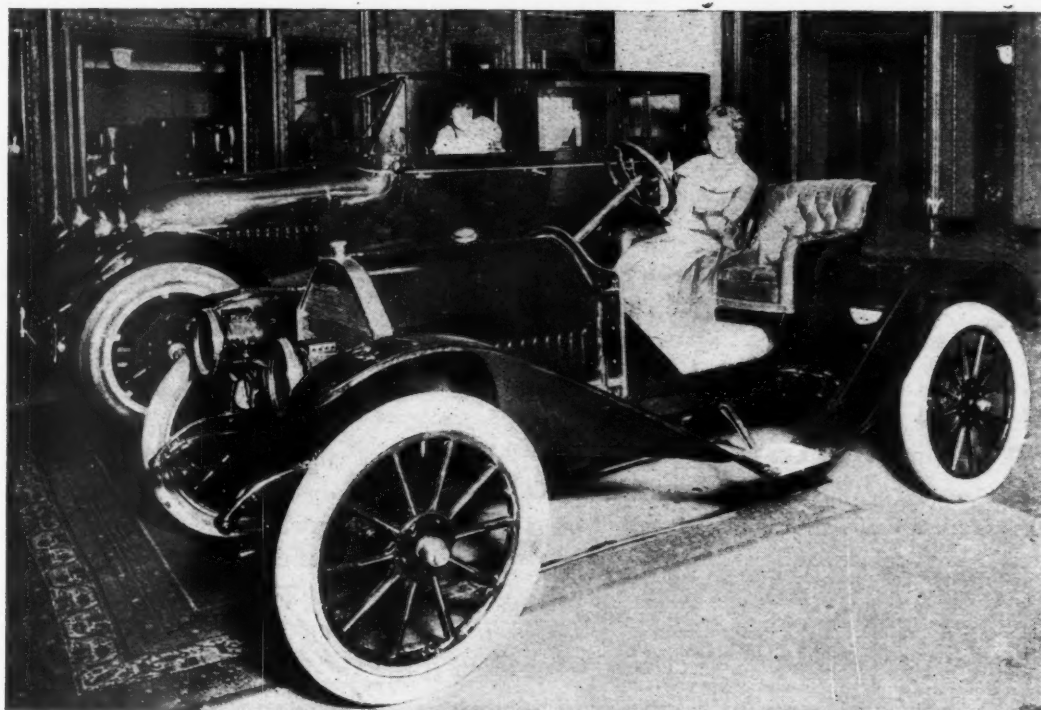
The Maryland and Delaware Coast Railroad, recently incorporated, has put Four Wheel Drive Rail cars to work between Maryland and Delaware



OF AUTOMOTIVE INTEREST



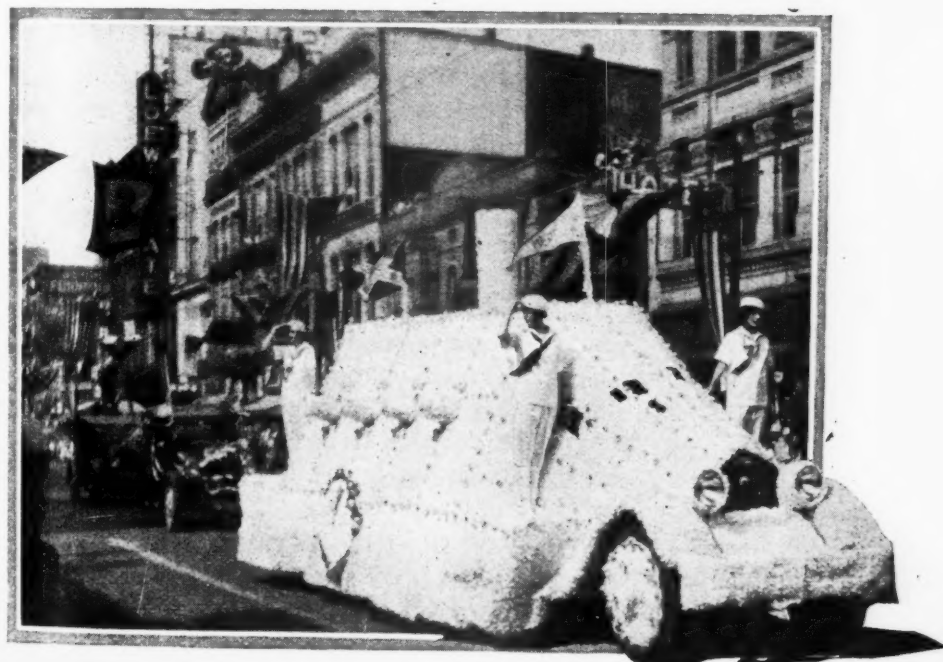
Belles—four of them. Harold L. Arnold, Los Angeles Hudson dealer, recently staged a sort of Pageant of Hudson Progress when he exhibited every model from the first 1909 Hudson down to the latest



The Annual Reunion of the Confederate Veterans at Memphis brought out a number of beautiful motor floats, one of which is shown here, manned with women



And this float was awarded third prize in the Apple Blossom Festival held recently at Wenatchee, Wash.



MOTOR AGE

Reg. U. S. Pat. Off.

Vol. XLVI

Thursday, July 10, 1924

No. 2

Julian Chase, Directing Editor
 P. L. Dumas
 Donald Blanchard, Field Editor
 C. G. Sinsabaugh, News Editor
 D. M. McDonald, Detroit News Representative
 Clarence Phillips, Chicago News Representative

B. M. Ikert, Technical Editor
 A. H. Packer
 W. L. Carver, Field Editor
 Warren Baker, Ass't News Editor

Sam Shelton, Editor
 Tom Wilder

Motor Age is published every Thursday by

THE CLASS JOURNAL COMPANY

Mallers Building, 5 South Wabash Avenue, Chicago

C. A. MUSSELMAN
 Vice-President and General Manager
 E. M. COREY, Treasurer
 HARRY TIPPER, Secretary

A. B. SWETLAND
 Vice-President and Manager
 W. I. RALPH, Vice-President
 E. E. HAIGHT, Western Manager

Owned by United Publishers Corporation, 239 West 39th Street, New York;
 CHARLES G. PHILLIPS, President; A. C. PEARSON, Vice-President; FRITZ J. FRANK, Treasurer; H. J. REDFIELD, Secretary.

Cable AddressMotage, Chicago
 TelephoneCentral 7045

BRANCH OFFICES

New York City—U. P. C. Building, 239 West 39th St.,
 Phone Pennsylvania 0080
 Detroit—7338 Woodward Ave., Phone Empire 4890
 Cleveland—538-540 Guardian Bldg., Phone Main 6432
 Philadelphia—56th and Chestnut Sts., Phone Sherwood 1424
 Indianapolis—1212 Merchants Bank Bldg., Phone Circle 8426

SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions.....	\$3.00 per year
Canada.....	5.00 per year
All Other Countries in Postal Union.....	6.00 per year
Single Copies.....	35 cents

Member of the Audit Bureau of Circulations
 Member, Associated Business Papers, Inc.

Copyright, 1924, by THE CLASS JOURNAL COMPANY

The 10,000,000th Ford

THE journey across the continent of a little car commonly called a flivver and bearing the numbers 10,000,000 stamped on the engine has more significance than the mere advertising of Mr. Ford's ubiquitous product.

It brings to our minds the story of the wonderful progress of the automobile from the crude affair that less than a generation ago chugged over dirt roads and frightened horses. Since that time 10,000,000 Ford automobiles have been manufactured and put into service delivering transportation. These cars, made modest in price and dependable in construction, have performed a very important function in the commerce of the United States and the rest of the world. They have brought recreation and happiness to millions of families. They have spread propaganda for good roads and as a result of the public sentiment aroused we have today thousands of miles of paved highways.

The Ford cars have not benefited their maker alone.

By the very multitude of them they have established the automobile as a household necessity. They have trained the American people to the use of the motor vehicle and thus have opened up a wide field for the ultimate sale of thousands of cars of more pretentious construction and higher price.

As an incident in America's commercial and social life the arrival of the 10,000,000th Ford is worthy of notice.

The Transportation Store

PRESENT conditions in the automotive industry should convert the most obstinate dealer to the transportation store idea. It has been demonstrated that the automotive merchant cannot depend upon car sales alone to provide him with a continuously profitable business. The sale of the car is only an incident in the business of automotive transportation. Readers of MOTOR AGE are referred to the Summer Service Number which was published in May in which there was an article entitled "Maintenance Outgrows Sales." In this article it was specifically shown that the amount of money expended annually for the upkeep and operation of motor vehicles greatly exceeds the amount spent for new vehicles.

That is the story of the transportation store. The sale of new cars and trucks is a part of its business but by no means the whole of it. When the vehicle is sold the transportation has just begun. And every mile of transportation has a definite cost in money. This cost must be paid. It is incidental to transportation and cannot be avoided unless transportation be dispensed with.

Let us take a lesson from the gas and light companies. They started selling service and now they are first class merchandisers of mechanical devices which increase the consumption of their product—service. But they make their legitimate profit on the mechanical devices they sell. The automobile merchants on the other hand, for years have been selling the highest class of transportation device but they have practically ignored the immense market for maintenance and operation service created by that device.

Suppose we look at it this way: The automobile merchant is a purveyor of transportation service which includes tires, fuel, oil, equipment, accessories, repairs, adjustments, storage, washing, lubricating and the many other items that go with the continuous operation of a motor vehicle. But he also sells motor vehicles. The more vehicles he can sell the wider will be his market for transportation service. The vehicle becomes a means by which the consumption of transportation service is increased. But the vehicle also must be merchandised on sound business principles—that is, at a substantial profit.

The service that this merchant provides must be the best and it must be economical so that the public will use more of it. The public service company, usually without competition, has learned that it must render

service of the highest type. The transportation merchant has competition which is all the more reason for his maintaining high grade service.

Perhaps the comparison here is a little far fetched, but if you know of any automobile dealers operating on a comparable basis you know some that are conducting highly profitable businesses and not complaining of poor sales.

The Mail Flies at Night

CONTINUOUS transportation of mail across the continent by airplane was inaugurated on July 1, marking the most notable step forward in the history of aviation. This new service means flying by night across that great stretch of plains and valleys between Chicago and Cheyenne, Wyo., with the roar of Liberty motors breaking the stillness.

Aviation's triumph is something in which the whole automotive industry shares the glory, for it is distinctly a triumph of the multiple-cylindere gasoline engine such as has been in the process of development for years in the automobile. The Liberty motor itself, which is the power plant of the mail planes, is the product of automotive engineering genius. It was developed during the war by men who had for years led in the designing and building of efficient automobile power plants.

Today the scope of the motor which made possible the automobile is enlarged. From the surface highways this motor mounts into the air and gives wings to the birdmen. The progressive steps taken by the government in the establishment of the continuous air mail service have a much greater significance than the mere speeding up of communication. These steps herald a new era in the development of motor transportation by air—an activity of such vast magnitude that the resources of the Federal government are needed for it.

Industry which has for its heart the internal combustion engine looks forward to the adding of a pair of wings.

New Models

THERE is no denying the public interest in new models of automobiles. And there is no denying that when the time approaches for the customary announcements and the whisper gets abroad that so-and-so is going to have something new, the buying public waits. This naturally produces an unhealthy stagnation of business while the public waits to see and compare the latest productions. It also results in actual loss to dealers who have on hand a supply of vehicles of a model that is being replaced by a new one.

On the one hand we would like to see business stabilized so that trade could go on without interruption the year round, but on the other hand the very heart and soul of automobile business is progress. Because the industry has been responsive to public desires and quick to incor-

porate improvements, sometimes dictated by competition, it has developed at the phenomenal rate that now ranks it with our leading industries.

No one having the future welfare of the industry at heart would be willing to check its progressiveness and initiative in the development of improvements. None of us should be willing to admit that the ultimate in economical and efficient automotive transportation has been reached.

Progress must go on, but at the same time the brains of the industry should devise means of transferring that progress to the salesroom floor without abruptly disjoining business for weeks at a time.

Accessories or Necessities

THERE are some accessories which when once used by the car owner are thereafter looked upon as necessities. Take the spot light, for instance. Glaring headlights are recognized as one of the greatest evils and dangers of motoring at night off of the lighted streets of the city. The danger is greatest on paved roads where there is a temptation to drive fast. The headlights of an oncoming car, if they are powerful enough to do the driver of that car any good, will blind the driver going the other way. But the driver who has an efficient spot light trained on his edge of the road at a reasonable distance ahead has a lighted area upon which he can focus his vision without the slightest danger of being confused by the bright lights coming the other way. The way to sell spot lights is to demonstrate them on country roads. It is a rare car owner who would consent to have a good spot light taken off his car.

A Phenomenal Plan

UNDER the heading "Our Phenomenal Plan" an automobile dealer recently advertised that he would accept used cars in trade for new ones at the customer's own price for the used one. Here is a quotation from the advertisement:

Our plan includes a special offer on terms—a liberal easy payment proposition that you can well afford. But the most remarkable benefit to you comes if you already own a car. Our used car department is actually oversold and needs more automobiles. During this time we will take in your car on trade on this new ——— at your own price (electrics excluded). We are leaving it to the honesty and integrity of our buyers to give us as square a deal as we will give them. This is the most liberal proposition ever offered in the automobile business.

On the last point there will not be much dispute. As to the soundness of the rest of the proposition the trade undoubtedly will find reason to disagree with the advertiser. One merit of the advertisement, at least, is that it gives other dealers an exact statement of the kind of competition that confronts them.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

This Car Probably Has Piston Slap

Q.—We are having trouble with a knock or loud click in a 1923 model 6-44 Oakland motor. This noise is not plain except when car is pulling on a hill. Would positively say this noise was a valve tappet or push rod although you can not effect it in any way by sitting on fender and holding them when motor is pulling. You can short out No. 2 cylinder and stop it. Have had piston out, rings and pins are apparently O. K. Motor was cleaned and has been driven about 500 miles. Noise has developed since cleaning. Any suggestions will be appreciated.—B. L. Frank, Elkland, Pa.

We believe that the knock is caused from one of two things, either a bent connecting rod or a piston that is worn slightly, producing what is known as piston slap. The recommended clearance for these pistons when fitted without any oil, is that they will just drop of their own weight through the bore.

This means in thousandths of an inch about $2\frac{1}{2}$ thousandths, that is .0025 of an inch clearance with about 5 thousandths at the top above the pin and the usual amount at the ring lands which will be about double to triple the clearance used at the skirt. If you will measure the diameter of the cylinder and submit the measurement to the Oakland dealer in your vicinity or the Oakland factory they will send you a piston of the correct size to be installed without any fitting.

A bent rod will be easily detected by putting the connecting rod on an alignment gage. It would be well to check for alignment after the rod has been installed by removing the oil pan, having someone turn the engine while you observe whether or not the top of the rod has a tendency to go back and forth between the piston bosses.

AXLE GEARS FOR 1918 BUICK

Q.—We have a 1918 model D-34 Buick roadster which gives us a lot of rear-end trouble and not only this one but most of the same models, give trouble due to breakage of the gears in the differential. Will you let us know if there are spiral bevel gears made which fit this model car, or else suggest some remedy for the trouble.—E. M. Blahink, Kellnersville, Wis.

One mistake which is often made in working on a rear axle is to install new bevel ring gear and pinion without truing up the differential carrier. When a gear breaks it is either caused by an unusual strain or else a portion of tooth comes between the pinion and gear and puts an unusual strain on the axle. This in nine cases out of ten will throw the differential carrier out of line so that when new

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

A Question of Years and Models and Law

Q.—About sixty days ago the writer recalls very distinctly reading in MOTOR AGE a Supreme Court decision from state in the east to the effect that an automobile dealer is justified in calling a car that is built late in the year as the following year's model, and if I remember correctly, some party who started suit on the grounds that his car was the following year's model was denied damages. We are exceedingly anxious to get a copy of this decision or the copy of MOTOR AGE which contained this article. Also if you have any decision handled in the state of Minnesota we would be glad to secure this. We will greatly appreciate any information you can give us at the earliest possible date.—W. S. Williams Motor Co., 128 Concord street, St. Paul, Minn.

We know of no such decision as you recall. The rule of contracts is that the seller must deliver exactly according to his agreement. If he sells a 1923 model car and delivers a 1922 model he has failed to deliver what was purchased.

And if he tells his buyer his car is a 1923 model when in fact it is a 1922 model he has misrepresented his car. Now if the buyer has relied upon his representation as to the model and has been damaged by this false representation then the buyer may either rescind the sale, or keep the car and sue for damages. If the buyer elects to keep the car his damages will be the difference in the value of the car and its value had it been a 1923 model as represented.

But the buyer must have relied upon the false statement of the seller and must have been damaged thereby. This rule is fundamental. Further, the misrepresentation must have been as to a material element of the contract. If buyer and seller deal on an equal footing, that is, have an equal knowledge of the subject that the rule "let the buyer" beware applies.

Again, it is quite probable that no court would say that the model of a car bargained for was not a material element inducing a purchaser to buy. However, whether a car manufactured toward the end of a year is the succeeding year's model is a question of fact, and what it is called between buyer and seller, does not change the fact. Now, this month's issues of MOTOR AGE (June, 1924) are advertising 1925 models. If a car is designed and manufactured and sold now and termed by the manufacturer to be his 1925 model, so it would be.

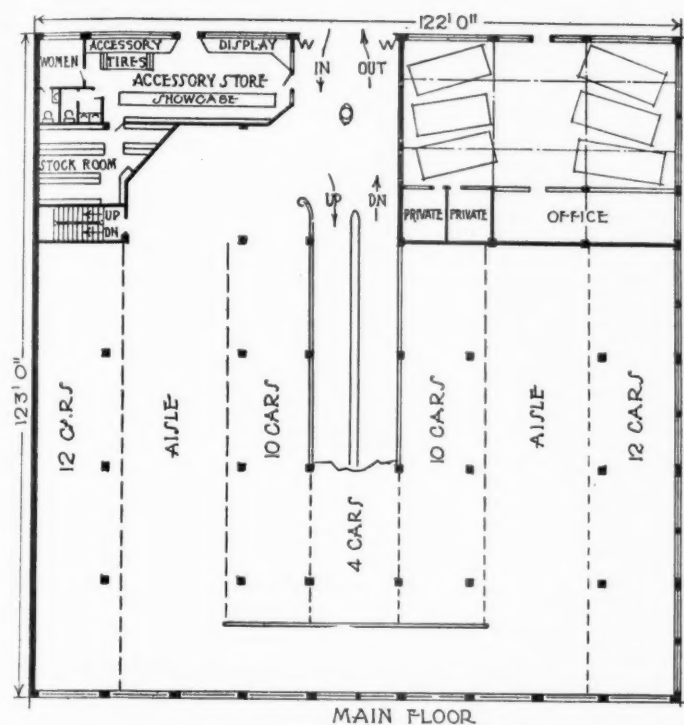
His agents selling such car in 1924 would not be misrepresenting the fact. The question is whether the car being sold is the model represented, regardless of when made, unless, of course, there is representation as to the date of manufacture.

gears are installed they will not mesh perfectly.

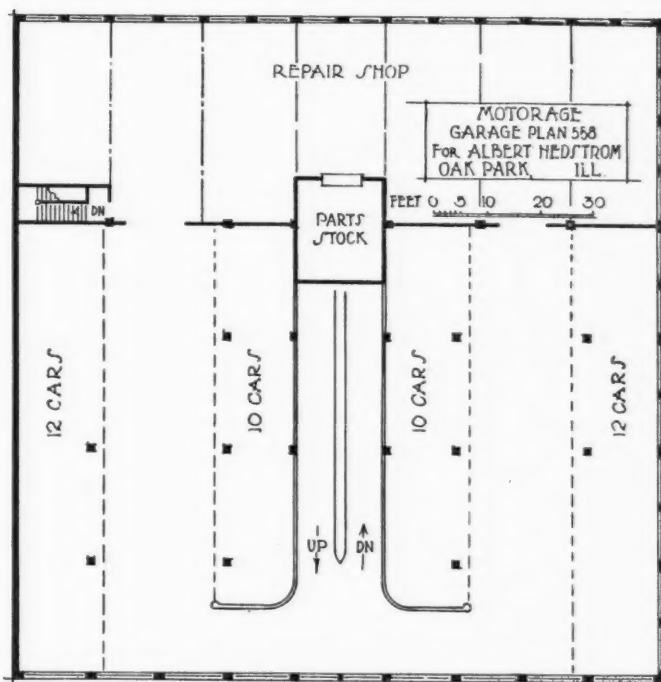
The differential carrier should be put in a lathe and turned to see if the surface against which the bevel gear is to be fastened is perfectly true. In doing this the differential carrier should first be checked up to see that the surfaces on which the bearings are mounted are turning concentrically before a check is made on the bevel ring gear surface. Another thing which will insure long life to the gears is to check contact between the teeth by painting them with white paint before grease is put in the differential housing. The rear axle should be jacked up, the engine run and the brakes applied so as to put a load on the gear teeth.

Then the contact can be seen by the places where the paint is rubbed off. If, for example, it should be seen that the teeth are making contact at only one end, it would easily explain why the end of the teeth would soon break off. We do not know of any concern making spiral bevel gears for this model.

This Would Cost About \$100,000



MAIN FLOOR



SECOND FLOOR

Q.—Please help me to plan a garage of which I have given full particulars. Thanking you in advance for your service.—Albert S. Hedstrom, Oak Park, Ill.

Our plan, we believe, includes all the points that you asked for except the stor-

age of 150 cars, which is quite impossible unless you fill all the aisles, but this is quite a common occurrence and while you have overestimated your building considerably most of our clients go even

further than you in this respect.

The estimate cost is rather impossible with the present unsettled conditions but as other buildings go this would probably come in the neighborhood of \$100,000.

Architectural Service

IN giving architectural advice, *MOTOR AGE* aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

PAPER ON DISTILLATION OF GASOLINE

Q.—What is the standard specific gravity of gasoline in the states of Virginia, Maryland, North Carolina and West Virginia?

We have not specific data on these states, but most states use the government specifications. These may be obtained through the Department of the Interior, Bureau of Mines, Washington, D. C., and asking them for a copy of paper No. 323, the subject of the paper being Specifications for Petroleum Products, Methods for Testing. We believe that the price of this paper is about 10c.

Q.—Is there any noticeable expansion in a 1000-gal. tank of gasoline in temperatures ranging between 60 degrees and 90 degrees?

Yes, the expansion is considerable, but we do not have tables showing the exact amount. However, this information can also be obtained when you write for paper No. 323.

Q.—Do you know of any book or books on the subject from crude oil to gasoline? If so, where they may be obtained?—P. M.

Phelps & Co., 4808 Washington avenue, Newport News, Va.

Your local branch of the public library will be your best source of supply on this. Engineering data used in the oil industry are not written up to a great extent, as refining of oil is confined to a few comparatively large concerns. In their files, of course, they have a great deal of information, but most of this is more or less confidential, and information of this character is not widely published. However, general information can be obtained as previously mentioned at the public library.

OLDS EIGHT SPORT

Q.—When was the last Oldsmobile eight sport model produced and what was the make of the body? Has there been such a car made in 1924?—Anna M. Springer, Dawson, N. M.

To the best of our knowledge this model was discontinued in 1923, but we do not know the date of the last one. This information can doubtless be obtained as well as the information on make of body by communicating with the Olds Motor Works, Lansing, Mich.

WHAT IS A DRY SUMP SYSTEM

Q.—Kindly explain the dry sump scavenger oiling system. James H. Ford, 850 Magazine street, New Orleans, La.

The dry sump scavenger type of lubrication differs from the regular high-pressure type in that there are two pumps used. A regular force pump is used to force the oil through the hollow crankshaft or camshaft and the second pump, known as the scavenger pump which is used to return the surplus or drained off oil from the bottom of the sump to the force pump to be re-circulated. With this type of lubrication the oil supply is usually contained in a separate tank away from the engine or crankcase.

ZENITH JETS FOR WINTON

Q.—Find enclosed stamped envelope in which please send me size of all the jets and the main choke or mixing chamber for Zenith carburetor to be used on Winton model No. 25. This engine is 3 3/4 by 5 1/4.—Ohio Subscriber.

A.—A model U-6 Zenith carburetor is recommended for installation. The internal specifications should be as follows: No. 21 choke, No. 20 main jet, No. 21 compensator and No. 50 idling well.

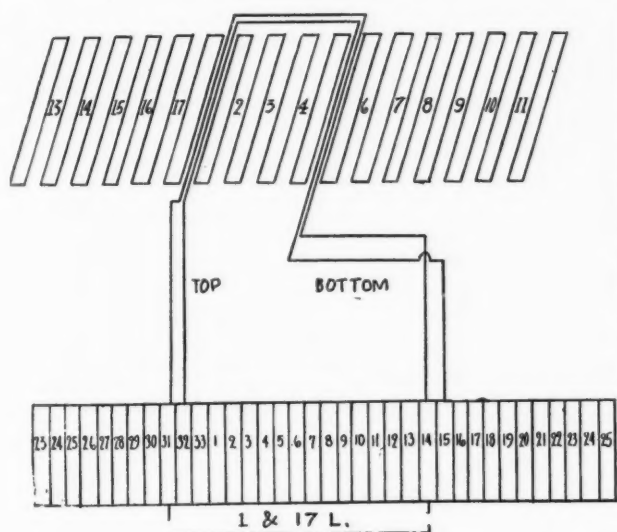
Recommended Tappet Clearance on Ford

Q.—We are regrounding a Ford cylinder block to .0625 of an inch oversize which will be fitted with aluminum alloy pistons for a customer who desires to use it in a racing boat. Can you inform us what valve stem clearance will give best efficiency, realizing that the valve stem clearance affects the closing time of valves? Thanking you in advance for the information, we remain.—Frazer Bros. Co., Adams, N. Y.

You do not state whether or not overhead valves are to be installed on this block and if so the maker of the overhead valve mechanism will advise his recommended clearance. Generally speaking, the clearance allowed on the overhead valve outfit is 18 to 25 thousandths for high speed and continuous service. When overhead valves are not used for racing they may be set to about 10 to 12 thousandths.

If the regular Ford camshaft is used and no overhead mechanism we would suggest setting the tappet or valve stem to push rod clearance 24 to 28 thousandths of an inch, measurements to be made with the engine cold. As high speed will cause considerable elongation of the valves would suggest that the clearance be also checked when the engine is warm so as to make sure that it is not less than 5 thousandths. Clearance of 24 to 28 thousandths is for the regular Ford valve, but if tungsten or special alloy valves are used it should be

Armature Diagram of Gray & Davis Generator



GENERATOR.
MAKE
GRAY & DAVIS.
TYPE 605
SLOTS 17
SEGMENTS 33
COIL PITCH 1 & 5
COILS PER SLOT 2
TURNS PER COIL 6
WIRE SIZE #17
WIRE INSUL. S.C.E.
COMM. CONN. 1 & 17 L.
TOP LEADS 3, 4, L OF S1.
BOTTOM LEADS 14, 15, R OF S1.
POLES 4
VOLTS 6
DEAD COILS 1
WINDING 1, 2, 3 ETC.
PAGE - 1919 TO 21.

Q.—Please send me a wiring diagram for winding the armature of a Gray & Davis generator, type 605, No. 1212.—Ray J. Bright, Monolith, Cal.

Diagram requested is shown at Fig. 169.

Q.—Where can I obtain books on winding automobile starter and generator?

This will be answered by separate letter.

Q.—What other cars would the hubs and wire wheels of a Lexington 1921 be interchangeable?

The hubs are not interchangeable for any other car, although the wheels themselves are interchangeable on a great number of cars, including Hudson, Chandler, Stephens, Studebaker and others.

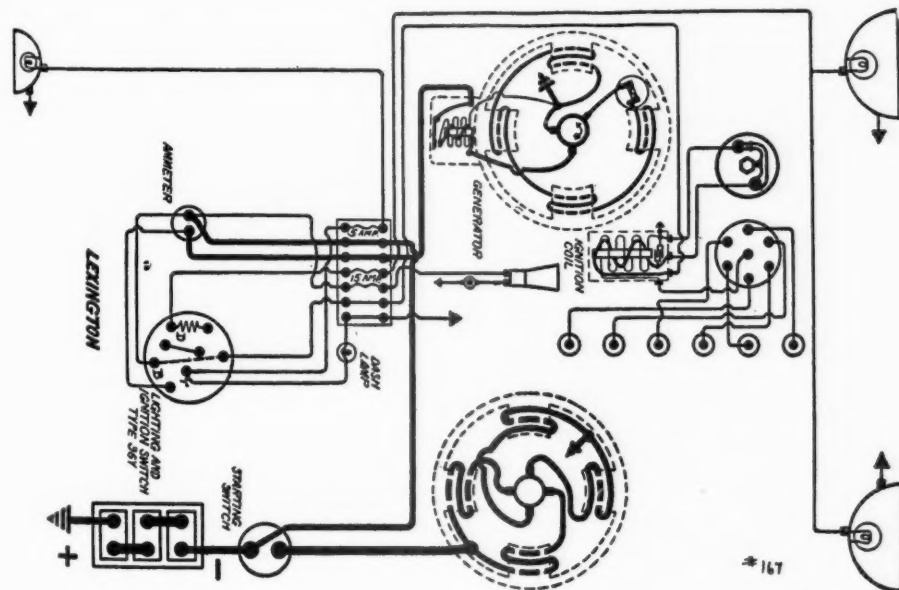
possible to decrease this clearance about 20 per cent.

CHEMICAL FOR USE IN CLEANING TANK

Q.—A short time ago you described in one of your issues of Motor Age a cleaning tank used by some repair shops for cleaning parts. I am writing at this time to inquire if you know of anything other than gasoline which can be used to clean such parts, and if you know of any satisfactory method of cleaning old greasy rags. We use quite a number of pounds of rags each month and would like to cut down on the amount used if possible, but this can only be done by cleaning them in some way. For cleaning parts we use a gasoline sprayer. Any information which you can give us relative to cleaning parts and rags will be greatly appreciated.—Tanberg Auto Co., Eau Claire, Wis.

There is a chemical on the market which is superior to gasoline for cleaning purposes and in addition involves no fire hazard. The name and address of concern supplying this chemical will be supplied by separate letter. As far as the cleaning of rags is concerned, however, we have never run across a method which is absolutely satisfactory. With the chemical suggested, however, it would do no harm to try cleaning a few of these rags and see what the results would be. There is no danger in using this chemical on metal parts and there is but slight discomfort in using as far as hands are concerned, as it can even be used to wash with when one's hands are quite greasy.

Lexington Wiring Diagram for 1920 Model



Q. Please send Lexington wiring diagram for model 1920 using a Remy starting and lighting system.—Charles E. Clark, 707 Van Buren street, Milwaukee, Wis.

According to our records the Lexington Company never since 1917 have used a

Remy system and we are therefore taking a chance in submitting the 1920 diagram which shows the Gray & Davis system as used on this car for the past four or five years.

Generator Regulator Explained

Q. Give me some information about automobile generators. As I understand it the amperage is controlled by the third brush or the vibrating regulator, but I do not understand how the voltage is controlled. Will you please enlighten me on this matter? Would also like to have you explain how thermostatic control works. My file of MOTOR AGE extends back about 18 months. Anaheim Subscriber.

One of the Bill Fixit stories which will appear in MOTOR AGE in the next week or two will describe very carefully the third brush system of control. Briefly this depends on the action of the armature current in distorting the magnetism so that the shunt field is weakened. Of course, if the battery should be disconnected no armature current would flow and we would have no regulation. In nearly all systems the voltage control depends on the generator being connected to the battery, for the battery has a natural voltage which is very nearly constant, except that it rises somewhat as the battery becomes charged. We are showing three illustrations, one of which gives the circuit for a current regulator, this being of the vibrating type.

Referring to this illustration it will be seen that field current goes from positive brush through the left coil, then through the right coil, then up to the regulating contacts and across them back to negative brush. The current which goes to battery goes to positive brush from the battery and in returning goes through a winding on an iron core. As this current becomes stronger it attracts the moveable arm and pulls the contacts open. When the contacts are open the field current must go through the resistance instead of through the contacts, which of course reduces the value of the current and weakens the generator, for the generator output depends on the strength of the field magnetism.

Then as soon as the output of the generator has been reduced the contacts will close again and this action will be repeated, resulting in a vibrating action of the contacts which regulates the current. This system is also dependent on the generator being connected to the battery, for if the circuit is broken there is no current flowing through the regulating winding on the iron core and consequently no regulation.

With this system there is sometimes used a fine winding on the iron core which is connected directly to the generator brushes in which case the machine is regulated according to voltage to a greater or less extent.

The three illustrations used are taken from a Remy service manual. Referring now to the two illustrations which show the thermostatic control. This control is used in connection with third brush machines and is so connected that the third brush field current must flow through the thermostat. The thermostat itself is mounted inside the generator so as to be affected by the generator heat.

One arm of the thermostat is made up

of bimetallic strip, the two metals having different rates of expansion. Accordingly as the thermostatic arm heats up it causes a bending which opens the contacts. Then when the contacts are open the field current must go through the resistance instead of across the points so that the amount of the field current is reduced, when the generator gets hot.

JACK DEMPSEY WAS NOT IN THE RACE

Q.—Please give me the name of a magazine and the number that published a complete engineering description of the engines on the Indianapolis speedway.—Louis Butman, Merkel, Texas.

The description of the cars raced at Indianapolis was published in the June 5th, issue of MOTOR AGE.

Q.—What were some of the characteristics of the Studebaker engine driven by Earl Cooper?

This car was a duplicate of the Durant and Miller Specials in every respect.

Q.—How did Jack Dempsey's engine perform?

The car entered as a Dempsey Special was driven by Elmer Dempsey and was a combination tappet and rotary valve engine. This car did not qualify due to a cracked cylinder.

Q.—Were there any cars using Deisel principle engine? What disadvantage would this principle engine offer in high speed engines?

To our knowledge there is only one passenger car built with Deisel or semi Deisel type engine and that is the two cycle, three cylinder Peugeot. The Deisel principle has always been applied to low speed heavy duty engines.

STAR VALVE TIMING

Q.—What is the correct valve timing for a 1923 Star car? The engine has fair power but has not much speed. The ignition is timed correct. The intake valve opens about four degrees past dead center. Is this correct? The engine is sluggish and does not pick up as quick as it should.—Elmer Hassenflug, Cassandia, Penn.

The correct valve timing of the Star is inlet opens four degrees after upper dead center and exhaust valve closes one degree after upper dead center.

Q.—What is the correct timing for a 1922 Chalmers six?

The exact timing in degrees is not available.

Q.—Could a Chrysler six cylinder engine be installed in a Chalmers frame. Would the Chalmers Company do this at the factory?

We do not have any accurate knowledge concerning this last question and we would suggest that you communicate direct with the factory at Detroit, Mich.

LEXINGTON HORSE POWER

Q.—Will you please tell me what horse power a Lexington 1919 model will develop? This car has a Continental 7-W engine.—D. W. Crase Garage, Brookings, S. Dak.

According to information supplied by the Continental Motor Company, the 7-W engine has a maximum brake horse power of 42 at 2100 r.p.m.

Obstructed Drain Hole Causes Leakage

Q.—I own a G. M. C. model 31 truck which leaks oil continually through a rear main bearing and runs out through the holes in the bottom of the flywheel housing in quite a stream, especially when going up a hill and when I pull the engine hard. I had the rear main bearings taken up and packed with packing as instructed by the G. M. C. people, yet it does no good. The crankshaft has a collector ring on it which seems o. k. It also has a metal half ring which comes down past shims as instructed by G. M. C. people, but nothing seems to stop the leak.—Colorado Contender.

The Continental model N engine used in the G. M. C. 1919 model 31 truck does not make use of packing at the rear main bearing. If you are having trouble with oil leaking through we would suggest that you look for a plugged oil return hole. This oil return hole runs all the way through the bearing bushing and bearing cap so as to allow drainage to return to the crankcase instead of flowing out past end of bearing.

The local G. M. C. service station advise that the hole just spoken of, be modified slightly so as to increase its capacity for the carrying off of surplus oil. Modification of the hole consists in countersinking one side of it, so as to provide easy access of the oil. The countersinking should be done on the side of the oil that first touches the crankshaft. In other words this will be the right side of the hole when viewed from the front. Use a cape chisel or half round chisel or other suitable tool to give the countersink effect.

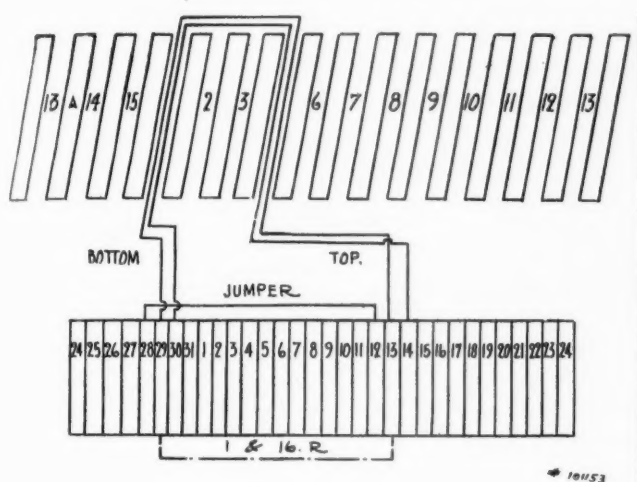
Four Possible Causes of Engine Noise

Q.—Also have a 1921 model touring Gardner car driven 4325 miles that has a knock in it somewhere that we have been unable to locate. The connecting rod bearings were taken up and timing gone over, valves ground and tappet clearance checked up. Mechanic claims main bearings are o. k. yet it knocks when I put the car on the engine. When coasting down hill the engine runs pretty without a sound. It also seems to have no pep in high or second gears. It will run a short distance in high on level ground and then die down as if it did not get enough gas. And again at times it will pull splendid on high. The engine seems to get quite hot on hard pull.

We would suggest that you refer to the May 15th, 1924 issue of MOTOR AGE and examine the trouble shooting chart contained therein. The May 22nd, issue also has a story regarding engine knocks and how to locate them. Our opinion is that this car has a loose main bearing but we would suggest also that the timing gears be examined for excessive backlash which will produce a knock, most noticeable at idling speed.

Another possible cause of the knock is piston slap, but piston slap is usually most noticeable when the engine is accelerated quickly. A mixture that is too lean will also produce a knock. In connection with the loss of pep we would suggest that the fuel supply system be gone over with special attention given to the vacuum tank and carburetor float mechanism.

Remy Armature Diagram



MAKE GENERATOR.
 REMY.
 TYPES 113, 161, 161B, 164B.
 SLOTS 15.
 SEGMENTS 31.
 COIL PITCH 1 & 4
 COIL PER SLOT 2
 TURNS PER COIL 6
 WIRE SIZE #17
 WIRE INSUL. D.C.C.
 COMM. CONN. 1 & 16 R.
 TOP LEADS 1, 5, 14, 2 OF 31.
 BOT. LEADS 3, 4, L OF 31.
 POLES 4
 VOLTS 6
 WINDING 1, 15, 14, AROUND CORE
 TWICE, ONE COIL AT A TIME.
 USED ON CARS
 BOUR DAVIS 1917
 VELLIE 1915-16-17
 SUN 1916-17-18

Q. I received your letter of April 24 and will say that the information was very satisfactory and has been of very much help to me already. I have another armature I am working on and would like to have some information on it. It is a Remy model 166 and is used on an Oakland. I believe the model of the car is 32. This armature has 15 slots and 31 commutator bars. I will very much appreciate information or diagram in regard to this armature. If possible will you tell me why they use an uneven number of commutator bars?—J. B. Galloway, Logan, N. M.

The diagram is shown in accordance with your request. We believe that the reason for using an uneven number of commutator bars is to give better commutation and better brush action. If we had 30 commutator bars, then two bars would go out from under the brushes at the same time so that it is likely that more arcing would result. With 31 com-

mutator bars and with 4 brushes on the commutator the commutator bars do not go out from under the brushes at the same time so that less arcing results.

With the number of coils and number of slots used only 30 bars would be necessary, so that with 31 bars in use instead of having two wires soldered in each commutator bar we will find that there are two bars which have only one wire each. This is the reason for using the jumper. This jumper appears to be a short circuit, but it is connecting portions of the commutator which are opposite each other and which in a four-pole machine are of the same polarity so that it does not really produce a short circuit, merely a connection between the two points of the commutator which are the same polarity.

POWER CURVES WANTED BUT NOT READILY OBTAINED

Q.—Furnish us if possible with the brake horsepower curve of the model 90 and model 4 Overland engine.—W. E. Smythe & Son, 404 North Orange avenue, Orlando, Fla.

This information is not available for the reason that most of the automobile manufacturers consider the horsepower curve as confidential information. In case you are figuring on using one of these engines as a source of power, however, believe you would be safe in figuring on 10 or 12 horsepower from them continuously. The model 90 engine is rated at 18.22 horsepower, the cylinders being 3 $\frac{3}{4}$ x5. The model 4 engine is also rated at 18.22, the cylinders being 3 $\frac{3}{4}$ x4.

You would probably get some 12 horsepower from the model 90 and about 10 from the model 4 at speeds ranging between one 1000 and 1200 r.p.m. While either of these engines will develop power greatly in excess of this figure it is not advisable to figure on a continuous load equivalent to the maximum power available, for automobile engines are not designed for this purpose. This

is due to the fact that when used in the car only a small portion of the power available is being used most of the time.

PAYMENT STOPPED WHEN CAR DID

Q.—In the case where a repair bill was paid by check and then payment stopped the following morning because owner was unable to start car after being completely overhauled and the garage that did the work was not called, what are the chances of recovering through court?—A Reader.

If you cannot settle your differences outside of court, then court is your only resort. Now the garageman can always recover for the reasonable value of his services rendered, and the customer cannot be the judge of his own case. Inability to start the car after overhauling may not have been caused from your work or failure to do everything agreed upon. However, if you contract to do a thing and then fail to do it you cannot recover on that provision of your agreement. Now the fact that you were not called to inspect and correct the difficulty may be shown to affect the claims of the customer.

Heat Treating Auto Parts

Q.—Let us know if the steering lever of a Hudson 1916 car is heat treated and how.—Enrique Huber, Inc., Mexico, D. F.

Yes, the steering lever or Pitman arm which transmits the steering motion from the steering gear to the fore and aft rod is heat treated, but we do not know the exact process. The treating of steel depends on the contents of the steel and different kinds of steel require variations in the treatment. The heat treating is generally for two purposes. One is to apply an outer surface which is especially hard and will resist wear while the other purpose of the treatment is to toughen the center portion of the steel. As the subject of steel and its treatment covers about 100 pages in the handbook of the Society of Automotive Engineers you can see that we cannot readily give a short answer to your question.

The general principle of carburizing, however, is to pack the steel pieces in bone dust or similar material which contains an excess of carbon and to keep the steel pieces in this bone dust at a comparatively high temperature for a considerable time. This increases the carbon content in the surface of the steel so that when the steel piece is heat treated the outer portion will be harder than the center. As an example of a typical treatment we will mention the S. A. E. heat treatment Nos. 1010-B and 1015-B which is as follows:

1. Carburize at 1650 to 1700 degrees Fahrenheit.
2. Cool in box.
3. Reheat to 1650 to 1700 degrees Fahrenheit.
4. Quench.
5. Reheat 1400 to 1450 degrees Fahrenheit.
6. Quench.
7. Reheat 250 to 500 degrees Fahrenheit.

In the heat treatment above illustrated the last process means that the part is heated over again to about one-third its former temperature in order to take out some of the excessive hardness produced by the last quenching operation.

REQUEST FOR A. A. A. REGULATIONS

Q.—Will you give me a set of rules governing dirt track automobile races, also a copy of the rules used by the A. A. A. on their speedway at Indianapolis?—LeRoy Roberts, Box 808, Elkins, W. Va.

Contest rules covering road, speedway and dirt track races under the jurisdiction of the A. A. A. are secured by communicating with the Contest Board, American Automobile Association, c/o Richard Kennerdell, Chairman, Franklin Pa. The International Motor Contest Committee, which organization has jurisdiction over some dirt tracks in this country, may furnish rules to you by communicating with Mr. A. R. Cory, Secretary, Des Moines, Ia.

BOOSTING ACCESSORY SALES

Not long ago a tourist stopped at an automotive dealer establishment and asked to be shown a certain accessory for use on his car. This particular dealer had not learned that in order to be successful in any business one must be progressive. He was forced to admit that he did not have the desired article in stock and the would-be customer was obliged to go elsewhere with his money.

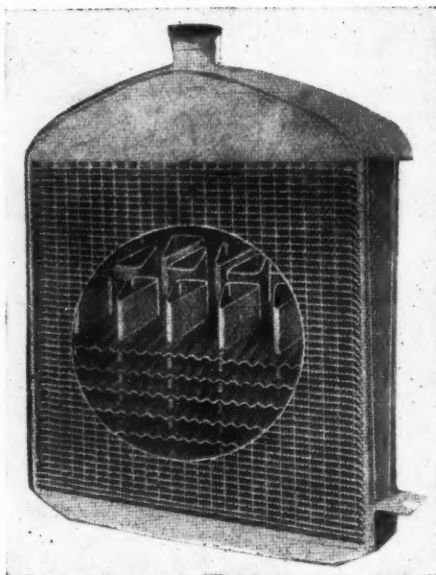
There is a lesson in this for every wide-awake transportation merchant. Why not get your share of this business? Stock the things that the public wants and you will save yourself embarrassment. There are described below some of the accessories which have recently made their appearance in the automotive market. They are well worth your study.

New Hartford Shock Absorber Has Free Neutral Zone

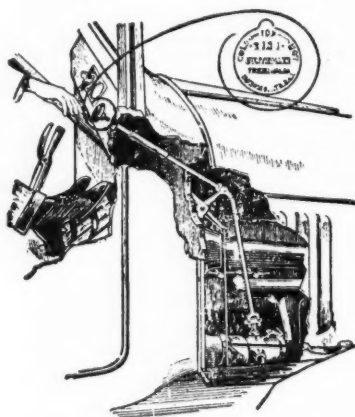
Edward V. Hartford, Inc., West Side avenue and Carbon place, Jersey City, N. J., have redesigned their Hartford shock absorber so as to provide a neutral range of motion over which there is practically no retarding action on the spring. The new shock absorber, like its predecessor, is of the friction disk type, but the member endowed with a rocking motion is now made in two parts which have a certain degree of angular freedom relative to one another. The parts of the rocking member are concentric, the outer one having formed integral with it the arm which connects by a link to a bracket on the axle. The inner part is a snug fit within the outer one and is driven from the latter by means of a roller clutch which takes hold only after the outer part has rocked through a certain angle from its central position.

Notches are cut in the inner circumference of the outer and the outer circumference of the inner part, in which is lodged a steel roller. The notch in the outer part is of elongated form, so that the roller has a certain freedom of motion within it. A C-type of spring on the inner side of the roller presses the latter against the bottom of the notch in the outer part, and after the outer part has rocked through a certain angle the collar reaches the end of the notch in it and the inner part is carried along. This allows of a spring play of about $5/8$ inch to either side of the normal position before the inner part of the rocking member begins to move.

The rocking member is located between two disks of treated wood, such as used in oil-less bearings, which are surrounded by shallow cups of pressed steel. The frame bracket and the stud around which the rocking member moves are made in a single piece, and the friction members are assembled on the stud and are pressed together by two star-shaped steel springs which are put under pressure by means of a nut on the end of the stud. The smaller spring, which chiefly deter-



McQuay Radiator



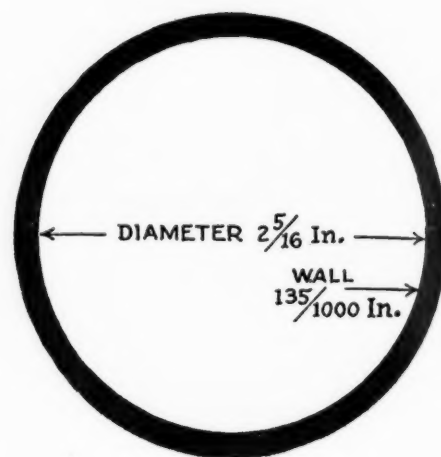
Turner Carburetor Control

mines the pressure between the wood disks and the inner part of the rocking member, is by far the stiffer of the two, and little resistance to the rocking motion is encountered as long as only the outer part moves. As soon as the inner part is engaged by the roller clutch the resistance greatly increases, and the real shock absorbing action begins.

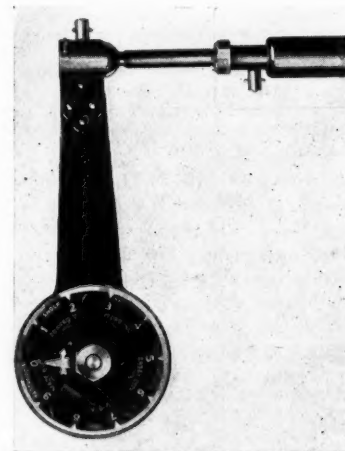
The new shock absorber is made in three sizes, to suit different sizes of car. Brackets have been designed and mounting methods worked out for all of the better known makes of car.

McQuay Radiator

A radiator which is declared by its manufacturer to afford protection against clogging, freezing and overheating is made by the McQuay Radiator Corp., 2237 Hampden avenue, St. Paul, Minn. Among its features are patented locked seam, triangular tubes to allow for expansion; also patented expanding corrugated radiating plates to accommodate all expansion and contraction caused by heat or



Cross-section Airotanks Inner Tubes



Hartford Shock Absorber

cold. The size of the tubes is designed to prevent clogging.

Turner Carburetor Control

The Turner 2-in-1 Carburetor Control for Fords gets its name because of its dual control of the carburetor, serving both as a choke and carburetor adjuster and giving to the driver complete control of the carburetor mixture from the seat at all times. The list price is \$1.25 and it is made by the Turner Mfg. Co., Kokomo, Ind.

Airotanks Inner Tubes

These tubes are made by the K. & W. Rubber Co., Delaware, O., and are manufactured from high grade rubber with only enough chemicals necessary to vulcanize, toughen and strengthen the stock. When inflated the tube stretches only slightly to fill the casing. The pores of the rubber are not opened enough to allow the air to seep out. A cross section of the tube shows diameter of $2\frac{5}{16}$ in. and wall thickness of $135/1000$ in.

Airotanks were used on Joe Boyer's winning Duesenberg at Indianapolis.

Quick Service and Flat Rate a Good Combination

Complete Brake Relining Job Performed by Chicago Shop in Four Hours at Price Quoted in Advance

HIGH speed specialized brake lining service is being offered to the motorists of Chicago by the Howland Motor Utilities Co., Michigan avenue and Twenty-ninth street, with very profitable results to the company. This company for some time has specialized in the installation and servicing of various items of motor vehicle equipment and only recently the special department for brake service was established. This department was put on a paying basis in a month of operation.

High speed service in this case means that the motorist may have his rear wheel service brakes relined and adjusted and have his car back in four hours. This means a great deal in times when car owners do not like to be deprived of the use of their vehicles for any great length of time.

There is another important feature which helps sell the quick service brake job. This is the quotation of a price for the job at the time it comes in. These two features together, the fact that the job will be done in four hours and that it will cost a certain amount quoted in advance, have been found to draw a great volume of work.

But this service station does not confine its efforts to the individual car owner. It goes after the independent garage

trade by offering to reline brake bands free for garages providing the relining material is purchased from it. The bands, of course, must be brought in already detached from the car. By this means the service station sells a great deal of brake lining at a profitable price. It has the distribution of a well known make of brake lining.

The other lines of service carried on by this company in connection with the installation and maintenance of equipment are based on the same principle of speed. Complete repair service is given on every line distributed by the company.

The service is made possible by the use of the best and most efficient machines made for the special jobs performed. In the brake lining department, for instance a machine is used which has a capacity of completely servicing one brake band every 10 minutes, including removal of the old lining and installation of the new.

Progressive methods are used to merchandise this service. Attractive cards and circulars are sent to car owners. Another circular is used to tell garages about the special service for the trade. Samples of the advertising matter are shown in the illustrations.

Howland Motor Utilities Co.
29TH ST. AT MICHIGAN BLVD
CHICAGO, ILL.

NEW SERVICE
Specializing on Brakes.

Of interest to all motorists, and especially to those who realize the importance of efficient brake equipment to the prevention of accidents, is the announcement by the Howland Motor Utilities Company, 29th Street at Michigan Avenue, of the inauguration of a distinct department in the way of a service station specializing on Motor Vehicle Brakes.

That this service may be 100% satisfactory, the Howland Motor Utilities Company has provided sufficient floor space to insure inside storage for all cars both before and after work on them is completed, and have installed the latest and most efficient mechanical devices for handling same. Particular stress, however, is placed upon the fact that in conjunction with the use of only the highest quality of brake lining, all work will be performed by skilled mechanics and under the direct personal supervision of a factory specification.

Many years experience in inspecting job turned out, and adjusting brakes to factory specifications, higher than the standard of the car.

With this equipment, and with the added advantage of an ideal location, it would seem that the Howland Motor Utilities Company is in a position to make good their intention of relining brakes so quickly in thoroughly a workmanlike manner and at such reasonable prices as to justify a liberal and continued patronage from the "safety first" class of car and truck owners.

Distributors of
Vesta
Batteries
Lamps
Generators
Lincoln
Shocks
Akers
Francisco
Auto
Hesters
Thomson
Inner
Controlled
Searchlights
Mazda
Automobile
Bulbs

Reliable Brakes are Best Insurance
Against Accident
And we furnish the policy
By making a specialty of keeping your brakes in dependable condition by expert inspection, relining and adjustment.

LOOK FOR THE SIGN

QUICK
HIGH SPEED BRAKE SERVICE
EFFICIENT

Skilled Mechanics. Highest Grade Brake Lining. Extra Prompt Service.
REASONABLE RATES.

HOWLAND MOTOR UTILITIES CO.
2838 Michigan Ave. Chicago 16, Ill. Phone Victory 5322

TEL. VICTORY 5322 2838 MICHIGAN AVE. (Corner on 29th St.)

HOWLAND MOTOR UTILITIES
High Speed Brake Service Station
CHICAGO, ILL.

May 30th, 1924.

I am at your Service Sir!!

Will you hook up with us on a plan that will help both you and us? Here it is!

We'll reline every brake band you bring us, without charging you a cent for the work or the rivets. All we ask you to do is buy your brake lining at our place.

—END—

While we are relieving you of the time and trouble of the relining job, you can be making money doing something else.

—END—

The rivets will be counterbored, so they cannot squeak. You may rest assured of an up-to-the-minute job done on the LEWIS BRAKE LINING MACHINE we've just installed.

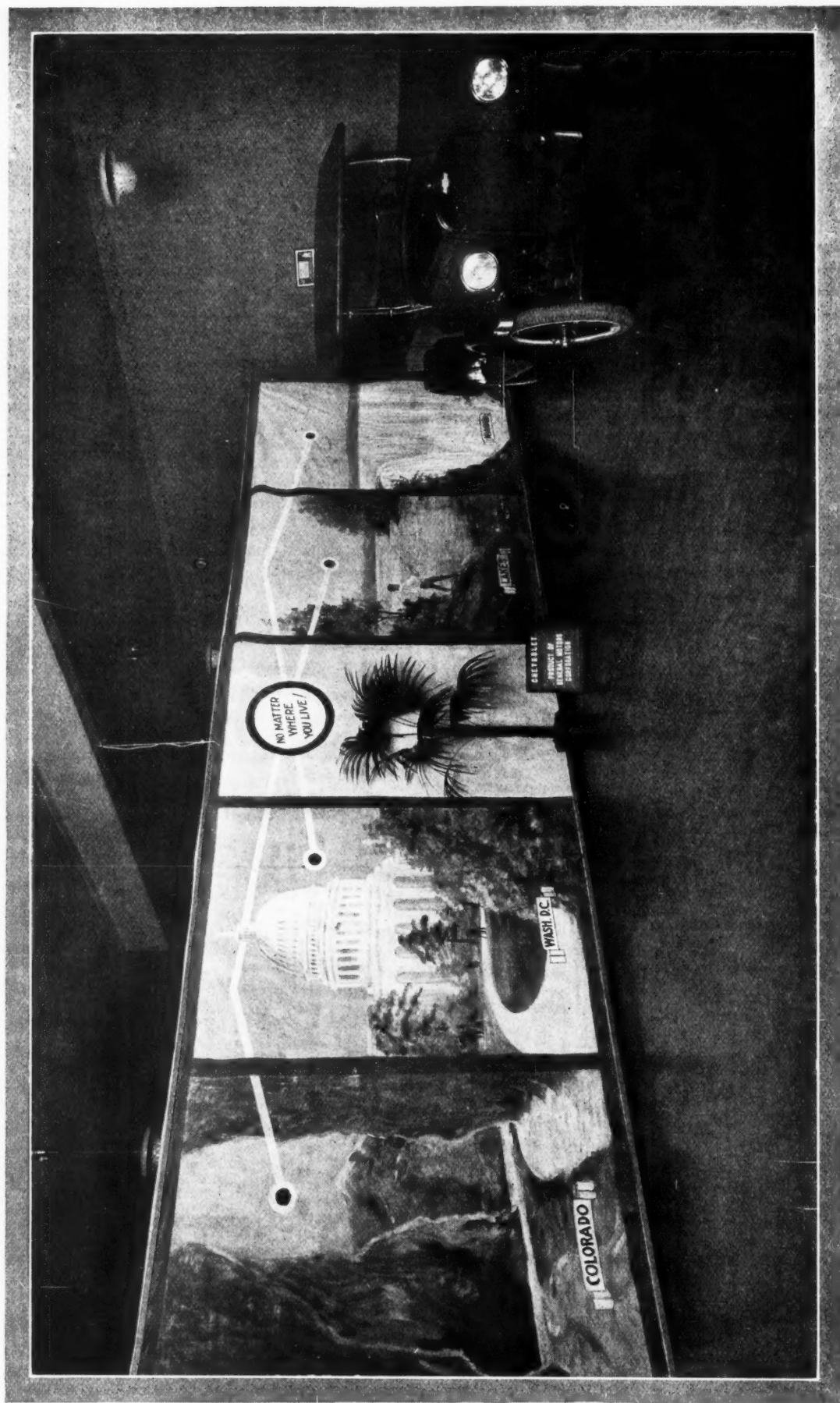
We'll use the very best material that money can buy—the famous brake linings which are standard on such fine cars as Packard, Franklin, etc.

That are my discounts on lining? Well, you won't be disappointed if you drop in and talk it over!

Yours respectfully,
HOWLAND MOTOR UTILITIES

The way the Howland Company tells the world about it

Putting Touring Appeal in Window Display



"*No Matter Where You Live*," says this window display used by the May Chevrolet Co., of Alexandria, Ind. The painting which forms the background calls attention to the fact that the modern motor car is ready to carry its owners over fine highways to the mountains, the lakes, the National Capital and many other interesting places.

SQUEEKS & RATTLES

"CONVERT Your Car Into Bed"—sign in service station.

What for—so the mechanic can sleep in it, or don't enough people sleep in their cars as it is without putting a bed in them?

Most of the Fourth of July tourists have now recovered from their sunburn but it is doubtful whether a few will ever recover from their gyp-burn.

"FOR SALE: 1923 Buick by lady with four wheel brakes." Ad in local paper. Is that a new way of saying "careful flapper"?

Recently, the Chicago Motor Coach Co. put signs on the driver's windows asking passengers not to talk to the driver. The sign advises that "it is dangerous" and that the conductor will gladly answer all inquiries. A lady, overlooking the sign the other day, asked the driver, "Does this bus go to the zoo?"

The driver replied, "No, ma'am—see the conductor."

Fable

Once there was a used car buyer who admitted he hadn't bought a better car than new and saved money doing it.

"The Sea Hawk" is the name of Rafael Sabatini's newest story and it is one of pirates who roved the sea in the good old days.

The moving picture version of the story is showing at a local theater and a gentleman after witnessing the spectacle last week, remarked, "This guy Sabitini must have been an automobile dealer before he took to writing."

"Why?" asked his companion.

"No man could write a story like that unless he had himself been a pirate once, that's why."

Worth Trying Once

A weary-looking fellow who had opened all the doors looking for work happened to see a huge police advertisement, headed:

"Murderer Wanted!"

"Well," he said, scratching his head, "it's better'n nothing, anyhow. I'm going in and ask for the job!"—*Richmond Times-Dispatch*.

Twentieth Century Statistic

Visitor: "What's the death rate in this town?"

Resident: "About two per automobile."—*American Legion Weekly*.

Nothing Would Faze This Guy

A hardened motorist ran down a jaywalker. "Hey," he shouted, "while you are under there take a look at my brake rods."

Perfect Couple

"Do you and your wife think the same about things?"

"Some things. When I'm out late she keeps on thinking what she'll say when I get home, and so do I."

Bass-ment

Frieda: "Say, Mr. Stein, why is the mouthpiece of a telephone full of holes?"

Mr. Stein: "That is so you can strain your voice."

In Deep

Smith: "It must take a lot of money to follow the radio craze. I hear you have a new outfit—what kind of receivers are you going to have?"

Smythe: "I don't know. The court hasn't appointed them yet."—*American Legion Weekly*.

Speeders, Beware

"Troops to Teach Road Safety"—headline.
Martial law?

"Watch Your Punctuation"

Sign in transportation store:

"For Sale: Cheap tires at best prices in city."

Another sign:

"We sell used cars that are as good as new accessories a specialty."

And another:

"Alcohol for your car and back curtains for Fords."

And still another:

"We make our work good at all times except Sunday."

An automotive merchant asked a radio broadcasting station to play "Minding My Business." "I want my competitor across the street the hear it," he added.

Stop Kansas City Race at 150 Miles

Murphy Leading, Milton and Hill Next as Flag Is Swung

Dangerous Condition of Track Reason for Ending Contest 100 Miles Short of Distance

KANSAS CITY, Mo., July 7.—The Kansas City Speedway race, July 4, scheduled to go 250 miles, was stopped at 150 miles because of the dangerous condition of the track. Twelve of the 16 racers that had started were on the track at the time, and prizes were awarded in accordance with their positions, four getting entry guarantee of \$500, as follows:

1. Jimmy Murphy, Miller Special.....	\$0,000
Time, 1:18:39 2-5, 114.43 miles average	
2. Tommy Milton, Miller Special.....	4,500
3. Bennett Hill, Miller Special.....	2,500
4. Harlan Fengler, Durant Special..	1,750
5. Earl Cooper, Studebaker Special..	1,250
6. Harry Hartz, Durant Special.....	1,000
7. Antoine Mourre, Mourre Special..	800
8. Wade Morton, Miller Special.....	700
9. Rob McDonogh, Miller Special.....	500
10. Peter De Paolo, Duesenberg Special	500
11. L. L. Corum, Duesenberg Special..	500
12. Fred Comer, Durant Special.....	500

Louis Wilson, driving the Vail Special for Ira Vail, went out at the twentieth lap with a burned-out bearing. Ernie Ansterberg, driving a Duesenberg Special, who had led the field from the sixteenth lap, was still leading at 57 when forced out by motor trouble. He attained 117.8 miles per hour. The previous track record was 116 2-5 miles per hour, made by Fengler last October. Frank Elliott, in a Miller Special, went out at the seventy-fourth lap, with a broken valve. Joe Boyer, Duesenberg Special, went to the pits with oil trouble, his leg being burned from the breaking of the line, and Ansterberg was preparing to take his car into the race again, when the signal to stop was given.

No Pit Stops for Five

The five leaders at the end, Murphy, Milton, Hill, Fengler and Cooper, and Corum, who finished eleventh, had not pit stops.

The Kansas City Speedway had only this one race for 1924. Therefore, it is said, there had not been the opportunity under the stress of speeding cars to reveal weak spots in the board track. Visible weaknesses had been repaired just previous to this race. Before the race started a committee of drivers was selected to go over the track and reach a decision as to whether it was safe for starting. This committee—Murphy, Hill and Boyer—O. K'd the track; but it was agreed among the racers and Fred Wagner, starter, and Shannon Douglass, official representative of the A. A. A. in Missouri racing, that if damage appeared, the race would be stopped. At the 100th lap, Mr. Douglas went to the east end

of the track, to watch the development of holes there, the place where danger was expected. And at the 120th lap, he signaled to Mr. Wagner and the racers were flagged down. Several large holes had appeared, but there had been no accident on account of them.

No driver was injured except Boyer and the burns he suffered were said to be slight.

The spectators seemed content, but the following day there were discussions and complaints against the alleged lack of adequate preparations for this race, both as to the track itself, and the conveniences of reaching the speedway. On the other hand, there was complaint by supporters of the speedway, that the community had not shown its loyalty to the sport, either by the support of merchants, or by the advance purchase of tickets by the public.

Association Bankrupt

The race was arranged and handled by L. J. Smyth, manager of previous races for the Speedway Association, as licensee from the Federal court, the association being in bankruptcy. The arrangement provided that the trustee should have all profits, beyond the fee to the manager, but that the licensee should bear any deficit. The profits were to go to creditors.

The attendance was about 20,000, the receipts around \$50,000.

A meeting of creditors is to be held soon, and decision reached as to the disposition of the Speedway property. Assurances have been given from some sources that motor races are sure to be continued here.

TIRE EXPORTS INCREASE

WASHINGTON, July 7.—The value of May exports of tires and tire sundries increased \$226,824 above April, the May total being \$2,113,602, it is announced here by E. G. Holt, assistant chief, Rubber Division, Department of Commerce. The number of automobile casings exported, 125,120, though less than in any one of the first six months of 1923, was greater than for any subsequent month.

From June to December, 1923, tire exports declined steadily, but every one of the first five months of 1924 has witnessed increased business.

M. AND A. M. ASSN. TO MEET

NEW YORK, July 7.—The fall meeting of the Motor and Accessory Manufacturers Association will be held in Cleveland during the week of October 6, according to announcement from the headquarters of the association. Definite dates will be announced later.

The meeting, which will cover three days, is dated later this year than last when it was held in Boston in September. Various committees in charge of arrangements are working out details.

Hudson Coach and Open Model Are Priced Alike in Revised List

Production Schedules of Line Show 75 Per Cent Closed, Essex 85 Per Cent

DETROIT, July 7.—Announcement by the Hudson Motor Car Co. of prices on its balloon tire-equipped models in which the coach and open models are priced alike indicates the tremendous ascendancy of the closed models in the Hudson-Essex line.

Production on closed models as outlined in the Hudson schedules call for 75 per cent closed, of which the much larger part is the coach. In the Essex line the schedule is for about 85 per cent closed because of the volume of its closed car business.

The Hudson company has reversed the usual position in the industry of the closed models being the production problem with consequent wide differential in price. With Hudson and its practical complete domination of its business by its coaches the open models present the problem in that they are the occasional car. It has been freely stated that but for the large demand from export markets for Essex open models this line would be confined entirely to the coach model. Even in the export market, however, the trend toward the coach in preference to the open model is large and increasing, this being especially true of the European trade. In the Hudson models there is a larger volume of open car domestic business than in Essex but this, too, is being largely converted into coach and closed car business.

Revised prices on the Hudson-Essex lines are:

Hudson speedster, \$1400; phaeton, \$1500; coach, \$1500; five-passenger sedan, \$2150; seven-passenger sedan, \$2250.

Essex phaeton, \$900; coach, \$1000.

Studebaker Resumes After Shut-Down of Three Weeks

SOUTH BEND, Ind., July 7.—South Bend plants of the Studebaker Corp. have resumed operations after more than three weeks' shut down. At present 3000 men are at work, and the employment schedule calls for an additional 1200 to be added during the week of July 7. The period July 14 to August 7 will see 2000 more employed. These additions will constitute approximately 55 per cent of the number employed at peak of production.

Men will be added throughout the summer months until the maximum of production will be reached, about October 1.

June Output About 15 Per Cent Under May, Survey Indicates

Unofficial Check Puts Car Production Last Month 235,000 and Trucks 30,000

NEW YORK, July 7.—Directors of the National Automobile Chamber of Commerce will not meet until July 16-17 at Buffalo and consequently the usual estimate of the previous month's production of cars and trucks is not available at the present time. A careful unofficial survey made by Class Journal Company representatives, however, shows that June production is about 15 per cent under May. This would mean the manufacture of about 235,000 passenger cars and 30,000 trucks, a total of approximately 265,000, compared with May's 312,813. Ford production is estimated to have been 145,000.

Truck production has not been so affected as has that of cars and it is estimated that the final figures on June will show in the neighborhood of 30,000 as compared with 33,374 in May. Trucks have been running steadily all of this year, for the makers of commercial vehicles have not been massing their production strength in the first quarter as did the car builders.

The last 10 days of June are said to have shown a slight increase in car production, caused by the introduction of new models which caused some factories to get busy. This new model phase is expected to bring the July count up above that of June, though this may be offset to a large extent by decreased output on the part of those concerns which are not changing models.

Line on First Half Year

This unofficial survey of June's work in the factories gives a line on production for the first half of the year. In the first six months of 1923 the production of cars and trucks totaled 2,017,156. Of this, the 1923 total is divided into 1,830,916 cars and 200,177 trucks, while in 1924 cars figure 1,823,501 and trucks 193,655.

From this however, it must not be expected that 1924 will equal 1923's 4,086,997, for it will be remembered that in the second six months of last year production was comparatively heavy, with 297,371 in July, 314,399 in August, 299,928 in September, 335,023 in October 284,923 in November and 275,439 in December.

Conditions are far different this year than last. In 1923 the industry made a slow start, turning out 798,393 in the first quarter, whereas this year the first three months showed 1,075,204. April followed with 373,139, then came the drop in production, May showing a decided falling off while June was 15 per cent under May. In 1923, though, the middle months of the year found the industry going at almost capacity and the slow down did not come until the last two months.

It is believed that for the balance of

the year the industry will move cautiously, sensing public demand and trying to meet it rather than endeavoring to run to capacity. It is pointed out that even with the present slow months that production is above what the statisticians figure to be normal and that 1924 suffers in comparison with 1923 only because the latter was a record-breaking 12 months.

Stromberg Opens Branch Factory in Minneapolis

CHICAGO, July 7.—The Stromberg Motor Devices Co., of Chicago, announces the opening of a factory branch in Minneapolis, at 1609 Hennepin avenue, in charge of D. G. Chandler. It is stated that the branch has been supplied with a complete stock of carbureters and parts sufficient to meet requirements of service stations and dealers of the territory. There is also a service station in operation at the Minneapolis branch for the accommodation of motorists of that city and St. Paul.

The chain of Authorized Stromberg Service Stations has been growing, there being at present about 3000 such establishments in all sections of the country where car owners are given attention in adjustments and repair of carbureters with Stromberg parts. The stations are making a strong feature of the Stromberg Package Equipments. These equipments are packed complete in individual boxes, with full instructions for installation and adjustment so the car owner can put on the new carbureter himself.

TO BROADEN OPERATIONS

CHICAGO, July 7.—The General Automotive Corp., of Chicago, has materially strengthened and widened its position in the accessory field as the result of reorganization just completed, says a company announcement. Besides adding to the personnel of those interested in the organization the names of several prominent business men, the corporation has decided to increase and diversify the output of its factory. Up to the present the General Automotive Corp. has been largely known through its distribution of Monogram Caps. Other items will be added to the production list, it is said, as rapidly as they can be turned out.

The newly elected officers and directors are: President, John J. Miller; vice-president and general manager, Howard F. Kingsley; treasurer, Lindsay H. Miller; secretary, Charles F. McElroy; directors, John J. Miller, Albert Miller, Lindsay H. Miller, H. S. Pardee and H. F. Kingsley.

CALGARY TO TAX MOTORS

CALGARY, Alta., July 7.—The Alberta government has given the right to Calgary to levy an automobile tax, ranging from \$5 to \$15, according to the size of the car. This is distinct and separate from the provincial tax.

Expect Automobile Output to Pick Up Late in Month

Policy Will Be to Make No More Cars Than Public Can Absorb

NEW YORK, July 7.—A pick-up in automobile producing schedules will come the latter part of this month as manufacturers complete their inventory taking and swing into production on new models. Some producers already have passed through the overhauling period and have announced the resumption of operations although on a smaller scale than when the period started. Plants generally, the early part of the month, are marking time.

June showed a marked recession from May in point of output, according to estimates based on reports from producing centers. The total number of cars and trucks produced during the month is placed at 265,000 compared with 312,813 in May, a figure that brings the aggregate output for the first six months slightly below that for the corresponding period a year ago. July of last year showed an output of 328,105, a mark that is not likely to be approached this month.

The June decline was not unexpected in view of the gradual slowing up in the preceding months. The summer season normally is slow in the production end of the industry with schedules low and plants being placed in condition for the resumption of heavy activity in the fall.

Retailing Big Factor

Retail conditions continue to prove a dominating factor in manufacturing operations and manufacturers will follow the policy of making no more cars than the public can absorb. As a whole, dealers report a further forward movement in their stocks and expect that with the touring season in full swing this will become more in evidence as the month advances. It is doubtful now, however, if stocks will be reduced to a point this month that will warrant manufacturers to increase their output much over the June total.

Contributing largely to the hesitancy in buying is the uncertainty of prevailing in business generally and while the curve of retail sales of automobiles is not below that in other lines of business it is not to be expected that it will rise to any degree until the improvement becomes widespread.

With the summer months out of the way an upward trend in operations may be looked for with the likelihood that the industry will be back to somewhat of its old level at the beginning of autumn. As car production increases it will carry along allied branches of the industry, bringing about greater activity with parts makers. That branch of the industry will step up under the stimulus of new model production, its pace being governed solely by the demands by car and truck producers.

Developing Star and Durant Sales, Campbell's First Task

New Vice-President Plans Large Program for Strengthening Dealer Organization

DETROIT, July 7.—With his appointment as vice-president of the Durant Corp., Colin C. Campbell, formerly widely known as a General Motors sales executive, has undertaken as his first duty the building up of the sales and dealer organization handling the Star and Durant models.

Factory capacities on these two cars approximates 1,200 to 1,500 cars daily at the manufacturing plants in Elizabeth, N. J., Lansing, Mich., and on the Pacific Coast, and Mr. Campbell said, while on a visit to Detroit this week, that he has started work on building up the present dealer organization to a point where it can readily market this production.

There is need for a general strengthening of the present dealer organization and there is considerable territory to be opened up. Within the next few months Mr. Campbell is planning to bring many new dealers into the group and to close up much of the present open territory. District offices will be opened at important cities in the country through which sales headquarters will keep in constant touch with the dealers.

Individual Representation

Sale of none of the cars making up the Durant line will be coupled-up, according to Mr. Campbell, but so far as possible he will adhere to the policy of establishing individual representation for each car. This policy will be carried out especially in the merchandising of the Star, he said, as necessary to get the volume business which a low-priced car must have.

By establishing individual dealer organizations for each line better credit accommodations will be afforded. Each dealer will be able to concentrate his efforts and the efforts of his salesmen to moving this particular car. Better service will also be afforded.

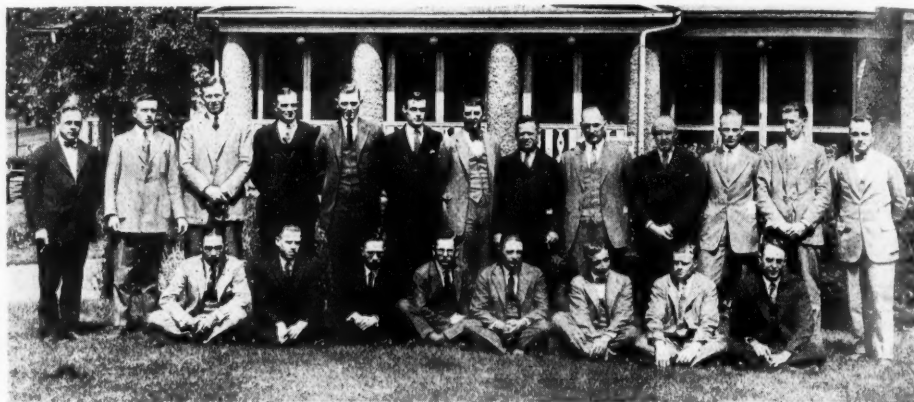
Regarding general policies on the extent of dealer territories, number of dealers, etc., Mr. Campbell said that these would be based upon territorial analysis, and along lines similar to those he has worked out formerly. Dealers will be placed in sufficient number to get all the business that can be obtained in given territories, he said, but there will be no crowding.

Every Walker a Prospect

Territorial analysis will establish the potential market as indicated by economic conditions and personal wealth of residents in given districts rather than by the number of residents. "Everyone that walks," said Mr. Campbell, "must be regarded as a potential buyer of an automobile until it is proven that he has no money and no prospects of getting any."

"Districts will be found under analysis

Branch Managers Meet



Branch managers of the North East Service, Inc., Rochester, N. Y., manufacturers of electrical equipment for automotive vehicles, held their annual convention recently at the company's general offices in Rochester. The convention lasted six days. In addition to several all-day business sessions, at which service, sales and business problems were discussed, considerable time was devoted to technical and engineering subjects. In view of the recent death of J. W. Tracy, General Manager of the North East Service, Inc., no formal entertainment was included in the program.

to have certain absorption possibilities for cars in all price classes. This will vary," said Mr. Campbell, "according to the wealth of the inhabitants. It remains then to establish enough dealers in each district to get as much of this potential business as can reasonably be expected."

The establishment of dealers in cities will be based similarly upon what the analysis shows. Cities must be regarded said Mr. Campbell simply as a number of smaller communities which have grown together but each of which retains to a large degree its own trading center. Each of these presents an opportunity for a dealer to develop a large business without invading the other man's territory in the next community, though definite territorial lines do not have to be set.

Should Carry Accessories

Dealers should carry accessories as part of the general automobile business, said Mr. Campbell relating his policy on these. This should be more to meet their customer's requirements than to push the sale of accessories, especially. They should, however, buy these themselves according to their own judgment, through accessory makers and jobbers, and not from the car factory.

Mr. Campbell said a wide advertising campaign would be undertaken to establish confidence and knowledge of the Star and Durant cars. In this connection he has engaged George Frank Lord as advertising manager, Mr. Lord having formerly been associated with Mr. Campbell in the merchandising of low priced cars.

In taking over the development of the Star and Durant merchandising work, Mr. Campbell said that, responsible for sales, he would be in charge of the work on these two lines from design at the factory, to service in the hands of the owner.

Noyes Plan Finds Champions Among New England's Dealers

BOSTON, July 7.—New England motor dealers may attempt to solve the used car situation after all through the so-called Noyes Plan since the federal government stepped in and disrupted the other plan worked out so elaborately by the Boston Automobile Dealers' Association. At a meeting the entire plan was discussed minutely. It was pointed out that New Bedford has joined the cities which voted to lease a building and start working under the plan, while dealers in Cheshire County, N. H., after a meeting at Keene, agreed to investigate the system fully. The New Bedford dealers sent a committee to all the cities where the plan operates and found it satisfactory.

In Boston the managers of used car departments formed the Boston Used Car Managers' Association recently and now they meet regularly and go into matters affecting the sale of the used cars, but do not have binding agreements on prices. In Boston, while some of the dealers believe the Noyes plan is feasible there are others who feel that it would not be a success in a big city where the competition is so keen.

I. M. C. TO MEET

CHICAGO, July 7.—Automotive merchants are invited to attend the sixth convention of the Interstate Merchants' Council, which meets in Chicago July 29 and 30. Many problems related to buying and selling will be discussed and business conditions reviewed. Twenty-five hundred retailers representing practically all lines and from 39 states are expected to attend. Sessions will be at Hotel La Salle.

Two New Tire Models to Be Offered by Akron Factories

Goodyear Has Another Balloon and Miller Comes Out With Type for Buses

AKRON, O., July 7.—Two new tires have been announced by the Goodyear Tire and Rubber Co. and the Miller Rubber Co. The two new announcements constituted the first innovations in the tire field for the past six months.

The Goodyear Tire and Rubber Co. announced a new balloon cord tire from "Supertwist" cord material, which, according to the announcements by the company, will practically double the life of the tire. The company in its statement emphasizes the fact that the fabric from which the new tires are made is the product of its own cotton plantations in the southwest.

The price of the new tires is said to be on a par with previous prices on balloon tires. The company stated that no cut had been made in the price of balloons as was intimated in some quarters.

New Bus Tire Model

The Miller announcement covered a new bus tire, fabricated for a combination of loads and high speeds. The company in its announcement pointed out that bus interests have demanded a different kind at a higher speed, but with the same loads in many instances.

Through the use of cord fabric, which is said to be at least 30 per cent stronger than that used in previous tires, the carcass of the tire, despite fewer layers of fabric, is stronger in the new tires than in the regulation cords.

The company has not as yet decided upon a name for the new product, but stated that the price of the new tire is the same as the price of other tires of the same size.

RECORD FOR CONSTRUCTION

ATLANTA, Ga., July 7. — New construction by automobile dealers of the South during the first half of 1924 likely established by far the largest record for that period in the history of the industry in this district, including newly built service stations, garages and sales buildings by both existing companies and newly formed companies, with a total of such projects that will reach nearly 1,000.

For the first five months the total reached 800, including the above and new companies formed, the construction involved amounting to several million dollars.

BUILDING FORD PLANT

NORFOLK, Va., July 7.—Actual construction has been started on the Ford Motor Company's Norfolk assembly plant. When completed it is said the plant will represent an investment of well over a million dollars.

A Live Merchandising Meeting



Automobile accessory and parts dealers and others identified with these branches of the trade from Cleveland, O., and 15 surrounding counties attended a spirited merchandising meeting June 23 at Nela Park, Cleveland. They were guests of the National Lamp Works of the General Electric Company, which gave them full run of its beautiful grounds and plant. There was a dinner, then merchandising talks, a showing of the A. E. A. film, "Profitable Maintenance," and plenty of music. Arthur R. Mogge, merchandising director of the A. E. A., spoke in connection with the film, while J. P. Harris, vice-president of the Union Trust Co., Cleveland, delivered one of the principal addresses on "A Banker's View of Business Today." T. K. Quinn, of the National Lamp Works, discussed the need of harmony and co-operation in the industry.

E. A. MOREE IS SPEAKER

ROCHESTER, N. Y., July 7. — The importance of a legislative committee to investigate the automobile business, especially all problems of motor vehicle operation and regulation, including taxation and compulsory insurance, was emphasized by Edward A. Moree, general manager of the Empire State Automobile Merchants Association, in an address before a gathering of Monroe county automobile dealers here. A committee will fore a gathering of Monroe county automobile named to conduct this investigation, Mr. Moree stated, and said the committee probably would hold hearings in the principal cities of the state at which automobile dealers and motorists would be given an opportunity to offer suggestions for the safer operation of automobiles. Thirty-five dealers in Rochester and vicinity have recently joined the Empire State Association the speaker said.

PLAN RACES AT BOSTON

BOSTON, July 7.—Boston is to stage automobile races at the Readville track here on September 6. Jack Le Cain, race driver, has interested prominent Bostonians in the meet, and say they have the tentative agreement from Jimmy Murphy that he will enter. If possible other drivers, like Joe Boyer and De Pablo, will be invited to race. There will be events for Fords, and for New England owned cars and drivers as well as handicap and pursuit races at 10, 15 and 20-mile distances. Officials of the Boston Motor Club will act as judges and timers.

Show Advance of Transportation

BALTIMORE, July 7. — Automobile dealers took prominent part in a big celebration recently which marked the opening of a new \$800,000 bridge over Severn river at Annapolis. One of the outstanding features was a pageant "The Spirit of Transportation."

This followed transportation in America from canoe and pack-horse to the modern automobile. Motor vehicles used more than a quarter of a century ago were displayed, as well as the latest offerings on the market today.

At the close of the pageant a heavy truck with a dummy driver in the seat was towed across the old bridge. Suddenly a trap was sprung and the truck appeared to crash through into the water. The old bridge will be torn down.

TRICO HAS FIRE

BUFFALO, July 7.—Fire on June 27 caused \$20,000 damage in the plant of the Trico Products Co. here. The firm manufactures automobile windshield cleaners and other accessories. An explosion of an oil furnace caused the fire. Six workmen narrowly escaped injury.

The first was confined to a portion of the plant and production will not be interrupted for any great period of time.

Finds Columbia Dealers in Best Shape of Several Years

Optimistic Statement Issued by Assistant Sales Manager Following Survey of Retail Trade

DETROIT, July 7.—According to L. E. Blocker, assistant sales manager of the Columbia Motors Co., the retail stocks of Columbia dealers are in better shape today than at any time in the past several years.

"Retail demand for Columbia Sixes has held up steadily throughout the past few months," said Mr. Blocker, "while at the same time the factory has lived up to the policy of the present administration in not forcing more cars into dealer's hands than their territory can logically absorb. As a result, Columbia dealers are making a splendid sales showing and are putting money into the bank."

This statement from Mr. Blocker is based on a survey of the entire market which he has just completed.

It is his opinion that the retail buyer of automobiles is very much in the market and that the only possible danger to automobile selling organizations will come from the attempt to force more cars through than common sense would indicate at the present time.

EVERY TO MAKE PARTS

PEORIA, Ill., July 7.—The first meeting of creditors of the Avery Co., bankrupt, makers of tractors and other farm devices, resulted in assurance that the plant will continue, for the present at least, to manufacture repair parts. R. J. Boynton, vice-president, the only witness examined, said that with the repairs season just opening for four months, the final value of the plant, when it is offered for sale, will be enhanced.

Mr. Boynton estimated total liabilities \$6,000,000 and assets \$8,500,000. A million dollars in accounts receivable are carried, he said.

Jay T. Hunter, representing 1,048 creditors with claims of \$4,632,110 suggested Mr. McDowell as trustee and Ira J. Covey, representing several unsecured claims, said the nomination was acceptable.

DRASTIC PARKING BAN

ST. LOUIS, Mo., July 7.—It has been decided to abolish all parking on two more main thoroughfares in St. Louis. The plan was first tried on Olive street, the city's principal retail center, and has been extended to include Washington avenue and Locust street.

Phillip H. Brockman, president of the De Luxe Automobile Co., Oldsmobile distributors here, who is also president of the Board of Police Commissioners, and Robert E. Lee, manager of the St. Louis Auto Dealers' Association, were active in the movement to extend the law.

Recommendations Looking to Greater Street Safety Made by N. A. C. C. Traffic Committee

Nineteen Cities Have Record of No Fatalities for May, Los Angeles Making Surprising Drop from April's 31 to 10

NEW YORK, July 7.—Analysis of the 430 motor fatalities for May reported to the National Automobile Chamber of Commerce by 190 newspapers and other agencies, proving that there has been a decrease, has led the N. A. C. C. Traffic and Planning Committee, of which George M. Graham is chairman, to make the following recommendations:

Safety Education and Playgrounds—Thirty-six per cent of the fatalities reported in May were children. Adequate playgrounds must be provided. If necessary special streets can be reserved as play areas. Education in crossing at cross walks and observance of other traffic conditions should be included in the school courses.

More Safety Zones—Most of the accidents continue to be cases of motor vehicles striking pedestrians. Safety zones give protection to the pedestrian and rob the motorist of any excuse for carelessness.

Analyze the Traffic—Buffalo has studied the flow of traffic along its various streets, knows the time and causes of its accidents and can apply fitting remedies. All cities should approach the subject in this scientific basis.

Activity With the Press—Constant hammering by the press on the causes of accidents, the need for scientific treatment of traffic, and the punishment of offenders serves to create the fundamental necessity of an intelligent opinion.

Impounding the Cars of the Careless—The motorist who disregards the right of others has no business on the highways. The reckless driver convicted by due process of law should lose the privilege of his car, in addition to other punishments, for a time commensurate with the seriousness of the accident he causes.

Five Months' Mishaps 1,773

The report compiled by Secretary John C. Long shows that the total of motor fatalities for the five months of 1924 in which the committee has been compiling these statistics is 1,773. May is a bright

spot in that 19 cities have a clean record of no fatalities. Los Angeles made the surprising drop to 10 from its April total of 31. Detroit cut from 34 to 24, Philadelphia from 30 to 21 and Buffalo from 10 to 7. Although Cincinnati's fatalities were twice as large in May as they were in April, this city has registered a decline in fatal disasters for the five months, the record being 38 in 1924, as compared with 52 in the same period the preceding year.

Commenting on the successful record by Detroit and the other cities, the National Automobile Chamber of Commerce points out that these communities have likewise been conspicuous for the efforts of the press, city officials, the schools, safety councils and motor clubs in safety activity.

Persistent War Winning

Detroit, in the face of enormous increase in motor registrations and discouraging higher traffic fatalities, has been carrying on an unremitting battle which is finally showing some results.

A safety week held in that city May 18-24 brought the subject of traffic control to the direct attention of 782,000 persons. Seven meetings were held in front of the city hall, there were 120 four-minute speakers at the theaters, 37 volunteer speakers in theaters, 15 noon meetings at factories, and other gatherings totaling 539. There was a parade of 93 floats, with 2,000 persons marching in line. Motion pictures were shown in 24 exhibitions and 197,000 pieces of literature were distributed.

This safety week, however, was simply the public demonstration of constant all-round effort on the part of the city toward traffic control.

WARNS TRUCK OWNERS

TORONTO, Ont., July 7.—At the annual meeting of the Ontario Motor Truck Owners' Association, S. L. Squires, deputy minister of highways, stated that overloading and speeding of trucks would be severely dealt with by the province and issued a warning to that effect. A gasoline tax is practically assured by both the prime minister and the minister of highways to take effect next year, and the heavy end of the burden will fall on the motor truck owner. It is estimated that on the basis of two cents a gallon the gasoline tax paid on a motor truck would be from \$75 to \$100 a year in addition to the tax now paid as license fee, which runs from \$14 to \$76, according to the gross weight of the vehicle.

WINTER FOR NEW MODELS

ST. LOUIS, Mo., July 7.—There has been quite a bit of criticism by automobile dealers here lately of the practice of automobile manufacturers in announcing and marketing new models at this time of year.

F. C. McDonald, president of the St. Louis Automobile Dealers' Association, said recently that putting new models on the market during the summer months practically holds up business for six weeks during a time when dealers should be gathering a harvest. It is the expressed intention of some dealers to see what can be done toward changing the date for placing new models on the market until winter.

Note Improvement of Car Movements in the Southeast

Sales, Especially in Low and Medium Lines, Showing Well in Smaller Towns

ATLANTA, Ga., July 7.—The automotive industry in the Southeast seems to have almost fully recovered from the recent period of depression with higher priced cars in considerably greater demand than was the case a month ago, and some improvement in the volume of business also noted by low priced and medium priced cars, according to Atlanta distributors.

Sales at the present time appear to be particularly satisfactory in the smaller towns and communities, especially in low priced and medium priced cars, where dealers are generally disposing of their allotments, and in some instances exceeding them.

This is true principally of Ford dealers, who are enjoying a decidedly good business, with the first half of the year one of the best periods in the Southeast in the history of the Ford business in this district. Cars in the price class of Buick and Studebaker have improved steadily in sales volume the past month, though not to as great an extent as lower priced vehicles. Conditions, however, are a little spotty. Some dealers are not disposing of their allotment, while others are having no trouble doing so, and a few are selling in excess of it, principally the latter in communities where the cotton crop prospects are good.

The summer outlook gives every promise of being normal for all priced cars, dealers looking for July business to hold up on a satisfactory scale. Regarding the district as a whole, the volume of business at present is about on a par with that of last year at this time, while used car demand has improved over the same period in 1923.

FACTORY'S BUYER DIES

TOLEDO, July 7.—Mecellus P. Cromling, 48, director of purchases of the Willys-Overland Co. here, died recently from a sudden attack of heart trouble.

He had been with the Willys-Overland Company about four years, having come to Toledo from the Buick plant in Flint, where he had occupied a similar position. Previous to that time he had served with the United States Steel Corporation for 19 years and was widely known in the trade.

INCREASE PLANT'S SIZE

FOND DU LAC, Wis., July 7.—The Morris Foundry, Fond du Lac, Wis., has been developed into one of the largest commercial brass, bronze and aluminum casting shops in Wisconsin as the result of the completion of a 2-story addition, 35 x 75 feet. This also provides a new metal stamping department and a polishing shop.

Truck Parade More Than Ten Miles in Length Proves Eye-Opener for Philadelphia Public

Pennsylvania's Greatest Demonstration of Modern Automotive Device Presents Exhibits Valued at Five Million Dollars

PHILADELPHIA, July 7. — What is conceded to be the greatest demonstration in Pennsylvania of the practical utility of the motor truck, was the impressive parade, ten and a half miles long, of 650 trucks, trailers and tractors, held by the Motor Truck Association, of Philadelphia, as the preliminary to its annual outing. Crowds of citizens, who never before had realized the vast extent to which trucks are being used in their own city, lined the streets and watched with absorbing interest the huge caravan of gasoline and electrically propelled vehicles as it proceeded through thirty miles of city streets in perfect order, at a rate not exceeding ten miles an hour.

Special traffic rules had been put into operation for the occasion and police were posted along the entire route. The value of the trucks was \$5,000,000 and their capacity 1,210 tons.

Following the police escort came an automobile containing the marshal of the parade, Charles H. Grakelow, director of the Department of Public Welfare; President F. H. Williams, of the Motor Truck Association, and members of the committee on arrangements. The procession proceeded in five divisions, with a well-maintained interval between the divisions.

Division A included the Public Utilities unit, showing the various types of truck used by the different city depart-

ments, State Highway Department, American Railway Express, Post Office Department, Marine Corps, Army Quartermaster Department, and the local electric power and lighting, gas and telephone companies; motor coaches and ordinary buses.

Division B comprised the Owner-Operator group and contained representatives in the line of trucks from almost every known industry and business in the city. There were coal trucks, oil trucks, ice trucks; trucks from numerous kinds of foods and provisions, etc.

Division C, that of Operators for Hire, contained a car bearing members of the Board of Division; a sign mounted on a White truck chassis and trucks representing virtually all the types of commercial vehicles offered for contract and individual job hauling.

Division D comprised that of Distributors and Dealers in automotive equipment and tires and made a notable showing of vehicles.

Division E, the final one, contained the representatives of the manufacturers, distributors and dealers in trucks, trailers and tractors, the Fordson, however, being the only tractor represented in the parade. This division also made a splendid showing. The official car carried members of the board of division; a sign on a Mack truck chassis and a band in an Electric truck.

OVERTIME AT CLEVELAND

CLEVELAND, July 7.—The Cleveland automobile factory has been working overtime since the introduction of its 1925 models in order to keep up with orders. Production of the new car has been increased 50 per cent in the last ten days of June.

Reports from distributors and dealers are generally optimistic about business prospects. Orders received thus far assure factory production at the present rate throughout July.

TO GIVE LIBERTY BONDS

BOSTON, July 7.—Joseph S. Donovan, Studebaker distributor in Boston, has announced that he will give away to purchasers of new Studebaker cars during the month of July a total of \$25,000 in Liberty Bonds. The presentations will begin with July 1 and continue through the month. Those who receive bonds may turn them back where they are buying their cars on time payments as part of the purchase price.

OFFER HIGHWAY BILL

ATLANTA, Ga., July 7.—A bill providing for a statewide bond issue of \$40,000,000, the money to be used toward construction and maintenance of a state system of permanent, hard-surfaced roads in Georgia, was introduced before the Georgia State Legislature, which is now in annual session in Atlanta. The Atlanta Automobile Association, with the co-operation of dealers throughout the state, is strongly advocating the measure.

ONEIDA CHANGES NAME

GREEN BAY, Wis., July 7. — The Oneida Motor Truck Co. has changed its name to the Oneida Manufacturing Co., following its pending retirement from the truck manufacturing field. It probably will make about 100 trucks this year to fill orders as they come in, after which it will devote its energies to the production of gasoline railroad motor coaches.

Wills-Sainte Claire Making Profit; Closes for Inventory

President Regards Condition of Company Very Satisfactory and Sees Bright Future

MARYSVILLE, Mich., July 7.—Since the introduction of new models in January, Wills Sainte Claire, Inc., of Marysville, has operated at a profit, according to a statement by C. Harold Wills, president and general manager of the company. For the first five months of the year, says Mr. Wills, profits were very satisfactory.

"As a result of not being stampeded during the early spring months," says Mr. Wills, "we have no cars stored in warehouses anywhere in the country and only a very small number of cars completed here at the factory, all of which are being held on distributors' orders for delivery.

"Orders on hand and retail sales indicate that our production for the summer will be little less than the schedule maintained during the spring months. Wills Sainte Claire, Inc., is in a very satisfactory situation from every angle and the future is exceedingly bright."

The Wills Sainte Claire plant closed for two weeks beginning June 28 for the purpose of taking annual inventory and in order to make some change in the different departments in rearrangement and installation of new machinery.

NEW MOTOR SPECIAL

ATLANTA, Ga., July 7.—Officials of the Southern Railway Co. have announced the inauguration of another "automobile special" to serve dealers and distributors of the South. The latest addition is known as the Tennessee-Carolina Automobile Special, and operates regularly between Cincinnati and Asheville, N. C., with automobiles and kindred lines exclusively.

Why More Own Cars Than Homes

DALLAS, Tex., June 30.—It has been known for some time there are more automobiles than telephones in Dallas, and there are 56,000 telephones in the city.

Now it is learned through the tax collector that automobile owners outnumber the home owners nearly two to one.

"It is more convenient to own an automobile than a home," the tax collector said. "And that, notwithstanding the fact that homes are being sold on the installment plan."

"The automobile is an absolute necessity now," said an automobile dealer. "That's the reason there are more automobile owners than home owners in Dallas."

JUNE OFF IN BUFFALO

BUFFALO, July 7.—Buffalo automobile dealers are experiencing the customary slump in business. It has come a little earlier than usual. Business in June, it is estimated, was one-third less than in the corresponding month of last year. For the first five months of the year business was as good if not better than during the same months in 1923. Many of the dealers feel that September business will be good and that there will be nothing to complain about the trade through the rest of the fall. Used cars have felt the present slump more than new ones.

RACES FOR STATE FAIR

SEDALIA, Mo., July 7.—The last day of the Missouri State Fair, to be held at Sedalia August 16-23, has been set aside exclusively as Automobile Race Day.

The management of the fair has contracted for six auto racing events for that day.

Sales Prospects Are Brighter Among Dealers in Milwaukee

Workers' Buying Checked by Employment Uncertainties—Market Proves Somewhat Choicy

MILWAUKEE, July 7.—Brighter prospects characterize the motor car sales situation in Milwaukee at this time, although there continues to be a tendency among car buyers to concentrate on a few chosen makes.

Dealers of popular priced cars catering largely to working people are not very optimistic about the business they expect to do this year. Employment conditions, while said to be better than in many cities of similar size, are not such as to warrant the investment of the workman's savings in motor cars, many laborers and even skilled workers, still on payrolls, fearing that they may be out of work before many more weeks. This situation is expected to adjust itself with the improvement of national economic conditions.

The reaction of dealers to the advent of new models differs. Those who have been doing a large business are confident that new models will stimulate sales to an even greater volume, while a few who have been accumulating an overstock in the past, feel that new models will make the old ones a burden on their hands. In general it is felt that the only trouble with the business at the present time, is that the weather has retarded the season by about thirty days. Confidence that the summer slow-up will also be postponed by a month, is practically unanimously expressed.

FRENCH EXPORTS IN APRIL

PARIS, July 7.—French automobile exports for the month of April totaled 4,112 passenger cars and 417 trucks or tractors, having a value of 106,846,000 francs, which value represents an increase of 37 per cent compared with the month of April 1923. The Belgin-Luxemburg Union heads the list of French clients, followed by Germany, Great Britain, Spain, Algeria, and Switzerland. In comparison all other countries took small numbers of cars. The exports to Germany dropped from 971 cars in March to 616 in April.

French automobile imports totaled 859, with a declared value of 9,149,000 francs, or an increase of 109 per cent compared with April 1923. The United States supplied 700 of the 859 automobiles reaching France from abroad, and 141 came from Italy.

AND SO THEY SWAPPED

CLINTON, Ia., July 7.—Julius Anderson, owner of a new garage in Preston, swapped his building and business to W. F. Schroeder, who owns the town's water works. Mr. Anderson takes over the water supply system and Mr. Schroeder will try his hand at managing an auto garage.

Making Tests of New Type of Creeper Band Automobile for Transportation Over Desert

PARIS, July 7.—Endurance tests are now being carried out in Southern Tunisia with a new type of Citroen-Kegresse creeper band automobile for desert transportation. While the same general lines of construction have been maintained as on the earlier Citroen-Kegresse machines, a more powerful engine, having a bore and stroke of 80 by 140 mm., is used, the rear axle has been redesigned and heavier and broader rubber creeper bands are fitted. The engine is the one which Citroen will fit in his six-passenger phaeton to be put on the market next fall.

The Tunisian tests, which were under

the control of Major Laffargue, started from the town of Tunis and were continued diagonally across the country to the oasis of El-Oued, and then eastward to the port of Gabes. A distance of about one thousand miles was covered at an average of 18 miles an hour. This new type of creeper track machine has been supplied to the British War Department, which probably will make use of it in Palestine. It is understood that both the Crossley and the Burford Automobile Companies in England are about to take up the construction of the Citroen-Kegresse machine for commercial transportation.

Wider Use of Motor in Short Hauls Given Referendum Okay

U. S. C. C. Voters Also Would Leave General Traffic Over Long Routes to Railroads

WASHINGTON, July 7.—By a vote of 23,214 to 4,191, the recommendations of the Special Committee on Transportation of the United States Chamber of Commerce were adopted by a referendum vote just announced by that organization.

Of the 14 recommendations made, four are of particular interest to the automobile industry, affecting directly the recommendations of that body for greater use and utility of motor vehicle transportation as one of the paramount means of solving the country's transportation problems.

The first of these recommendations is that store-door delivery and collection should be established as rapidly as practicable by agreement between the carriers and the shippers. L. C. L. shipments should be delivered promptly on arrival, thus avoiding the delay arising under the present system of notifying consignee and holding goods until called for.

Under the head of store-door delivery the committee recommended that all rail haul should begin and end at an outlying station, readily accessible to highway vehicles, thus avoiding the delay and expense of moving cars or freight through the terminal to some L. C. L. freight station in the congested district. The point is made that the L. C. L. shipments must be handled by truck anyway and that the economical way would be for the railroad systems of the country to be augmented by motor transports as an auxiliary to the railway service.

Would Reduce Congestion

Were this done, the committee's report points out, it would (1) relieve the railroads of the necessity of increasing their expensive L. C. L. freight stations in the heart of the busy, and generally congested, business district, and (2) street congestion would be reduced.

The second recommendation was that greater use be made of motor vehicles in short hauls and that the motor transportation companies abandon long and excessive hauls to the railroad lines.

"In the interest of the public," the report states, "the railroads should be permitted to discontinue unprofitable service to which the motor is better suited and the motor vehicle abandon its effort to handle general traffic over long distances."

I. C. C. Regulation

The third recommendation adopted, of particular interest to the automobile industry, and especially to the highway motor transport phase, is that interstate motor transports, carrying both freight and passengers, should be subject to regulation by the state and federal commissions which have jurisdiction over the operation of other common carriers,

Hot Months Best for Farmer Sales

DETROIT, July 7.—Olds Motor Works is mailing to all its dealers the chart prepared by the National Chamber of Commerce, outlining the percentage of automobile buying by farmers in the different months of the year.

According to the chart, says the company, July, August and September are the largest farm buying months of the year and it urges its dealers to make special efforts in this market during this period.

i. e., the Interstate Commerce Commission, having particularly in view insuring to the public adequate economical and continuous service.

In submitting the original report, the minority report offers a strong protest against the regulation by the I. C. C. of motor transportation, pointing out that the full scope of motor transport has not yet been determined and that any attempt to regulate its operation would greatly check its development, "at a time when expansion and such development is greatly needed," the report adds.

The fourth recommendations, adopted, is that in addition to bearing an equitable share of the general tax burden, the road users should pay the entire cost of maintenance of highways through special taxes levied against the automobile and truck users, such special taxes being applied exclusively to that purpose.

Germans Prepare for Lifting Country's Import Restrictions

WASHINGTON, July 7.—Acting Commercial Attache Donald L. Breed at Berlin has notified the Automotive Division that a Berlin firm has ordered two sample touring cars for demonstration purposes from an American automobile factory, preparatory to lifting of import restrictions expected next October.

Attache Breed says "this is an interesting instance of actual import business being done in this line, and a hopeful sign of the opening of the German market to American cars. The securing of import permits for these sample cars will not be attended with difficulty, as they will come under an exempted class, i. e., demonstration cars." In 1923, the United States only exported 64 passenger cars and three trucks to Germany.

MANY CARS BURN

FT. DODGE, Ia., July 7.—Twenty-five new Overlands and 18 stored cars were destroyed in a \$35,000 fire which swept the Overland-Fort Dodge Company plant, 525 First avenue, south, early Monday morning. The Clemens Auto Company, Des Moines, of which the local company is a branch, owned the cars, except one. L. B. Bentley is local manager and said that business would be resumed as soon as location could be cleared away. Insurance covered the fire loss.

Mid-West's May Sales Below April, Reports Reserve Bank

Finds Chicago Stocks Lower as Result of Checked Flow from Factories

CHICAGO, July 7.—In its report of business conditions in the Seventh Federal Reserve District for the month of May the statistical division of the Federal Reserve Bank of Chicago makes the following comment with respect to automobile sales:

"Dealers and distributors of the Middle West report a smaller volume of passenger cars sold at wholesale and retail during May in comparison with April, and with May a year ago. As was the case in April, the number of new cars in the hands of dealers was less than in the preceding month, while the year-to-year comparison shows a continuation of the large gains shown in the past months. Sales of used cars during the month also receded from April, as well as from May, 1923. Fewer used cars were in the hands of dealers on May 31 than on April 30, but the number considerably exceeded that of a year ago. Used cars on hand May 31 represented 111 per cent of the May used cars sold."

Reports received by the bank from Chicago warehouses, it was stated, indicated some improvement in the movement of cars to consumers and a reduction of cars in storage as a result of slowing down in replacements from the factories.

The bank's survey of industrial employment indicates that such employment in the district on the whole was curtailed somewhat more than in Illinois, according to a report by the Illinois Department of Labor. The bank puts the district's employment slump at 3.5 in numbers while that for Illinois was estimated at but 2.5 by the state department. This might be taken as substantiation of a contention that while industrial conditions in Illinois and the Chicago district are caught in the general slowing down of operations this immediate section really suffers less than some others. In the vehicle division, which includes automobile factories, the banks' reports indicate an employment slump in May as compared with April of 2.9 per cent in numbers and 7.8 per cent in earnings.

MEASURE HITS AT BUS

ATLANTA, Ga., July 7.—For the third successive year a bill has been introduced before the Georgia State Legislature to regulate the motor bus industry in this state, and have the bus declared a common carrier, subject to the same rules and regulations as the railroads, under the jurisdiction of the Georgia Public Service Commission. The bill, as heretofore, is largely sponsored by the short line railroads of the state, which are frank to state that the motor bus has made such inroads on their profits that comparatively few of them are now able to operate at a profit.

Citroen Announces Price Increase of Thousand Francs

Tells Dealers at Congress Advanced Rates Will be Retroactive to May 15

PARIS, July 7.—An increase of one thousand francs on all cars, to be retroactive to May 15, is the announcement which Andre Citroen made to his dealers at the periodical trade congress recently held in Paris. It was also announced that in future all deliveries would be made on balloon tires. Because of the higher cost of balloon over high pressure tires, the net increase in price on Citroen cars really amounts to 750 francs.

The announcement was not unexpected, for Citroen several months ago warned his dealers that orders should only be accepted on the understanding that prices might be increased without warning. Several French firms are refusing to book orders on a fixed price basis, except for immediate delivery. The manufacturers reserve the right to increase prices without notice, but give clients the option of canceling.

While Citroen is the first in France to announce balloon tires as standard equipment, the proportion of cars up to twelve horsepower delivered by big high pressure tires is only about 25 per cent of the whole, and the indications are that several others will soon make balloons standard equipment.

Citroen is now averaging 220 cars a day, while Renault's output stands at 140 a day average; the latter firm, however, producing cars up to 40 horsepower, has a bigger turnover.

PLAN SHOW AT DALLAS

DALLAS, Texas, July 7.—Automotive men of Dallas are preparing for the annual fall automobile show, which will be held in their own display building at the State Fair grounds October 11 to 26. They are arranging to have all the new models on display and say they will have by far the biggest automobile show ever staged south of Chicago. Admission to the show will be free. More than a million persons usually attend the fair. Probably 600,000 of these will see the automobile show this fall.

Plans are being made for displays of accessories, parts, tires and tubes as well as trucks and tractors. These will be displayed in buildings adjoining the main automobile buildings if present plans materialize.

JUNE TRADE GOOD

SACRAMENTO, Cal., July 7.—Final figures on sales in Sacramento County for May show the same number as in May, 1923, despite the fact that the state as a whole showed a 35 per cent loss. June business is declared to be good, the first week having been one of the best in Sacramento's history.

Pays Damages For Hitting Engine

HALIFAX, N. S., June 30.—A man driving a motor truck over a level railroad crossing near Halifax, was hit by an engine. He took action against the railway company for damages.

The railway's response was formal action against the motorist for damages to the company's locomotive. Its pilot had been dented and the paint knocked off to the value of \$31.00, so it was claimed.

The railway claimed that the track either way from the crossing was visible and that the whistle was blown several times before the train reached the crossing. Instead of receiving damages from the railway company the man was advised by his lawyer to pay the railway's claim and nurse his wrath in silence at the apparent injustice.

Florida Trade in Good Shape Compared with Other Sections

NEW YORK, July 7.—K. W. Zimmerschied, formerly general manager of the Chevrolet Motor Co., is in New York, stopping at the University Club, after an extended residence in Florida, where he has been recuperating from the effects of a serious illness contracted in 1922.

"Sales of motor cars in Florida are very encouraging, in contrast to what I hear about business in other sections of this country," said Mr. Zimmerschied. "Florida is generally regarded by those who have not been there in recent years as being dependent upon its orange crop. While it is true that the citrus crop is the mainstay, it is being eclipsed by the phenomenal development of the truck garden industry.

"The advent of the motor car has meant a good roads movement which is second to none in the country. Special attention is paid to the system of cross-state highways which has opened up enormous tracts of fertile land. In turn the good roads have meant a big demand for passenger cars and light trucks from farmers who are using this means of transportation to bring their crops to market."

SELL ROAD BONDS

RALEIGH, N. C., July 7.—North Carolina has sold \$10,000,000 road bonds for additional road construction. Heretofore the state has sold \$35,500,000 of highway bonds, and has borrowed \$15,500,000 on short-term notes for highway financing. The total amount of bonds authorized is \$65,000,000. The highway commission plans to finish up its work under the present mandate early in 1925.

De Dion Bouton to Take Over Bellanger Plant, Near Paris

French Organization Plans Production of 8 H. P. Car in 1925

PARIS, July 7.—De Dion Bouton has signed an agreement to purchase the whole of the factory buildings and equipment of the Bellanger Brothers, at Levallois, near Paris, and, it is understood, will make use of these works for the construction of a popular type 8 horsepower car expected to be ready for marketing early in 1925.

The Bellanger Company, which assumed considerable proportions during the war, took up automobile construction in 1919, its line comprising both a high-grade four and an eight and, in addition, a low price assembly job originated by Mr. Benjamin Briscoe, the parts for which came from Detroit.

The high-grade cars were soon withdrawn, but although a persistent effort was made to popularize the cheap car it was not successful and finally the accumulated stock was disposed of by making the machines into taxicabs. Of late Bellanger has been specializing on heavy oil engines, tubes and bicycles parts.

STOCKS WELL CLEANED UP

COLUMBUS, O., July 7.—While sales have been about 65 to 70 per cent of those last year, dealers and distributors in Columbus and Central Ohio territory have been watching buying closer with the result that generally speaking, stocks are pretty well cleaned up. Some few dealers have heavy stocks, but most of those handling lines which usually come out with yearly models about the middle of the year are in shape for the change.

The warmer weather which has prevailed for the past few weeks had the effect of stimulating sales to a certain extent but business is about 35 per cent below the figures of last year. In some lines the percentage is even smaller, amounting to as much as 50 per cent of last year's sales.

Used cars are selling slightly better than formerly but there is still considerable difficulty experienced in moving them.

BIG GAS CONSUMPTION

MILWAUKEE, July 7.—Wisconsin motorists consumed nearly 20,000,000 gallons of gasoline in the month of May, spending therefore the equivalent of \$3,875,000, according to figures compiled by the state oil inspection department. The activities of this department enable the state to keep an exact check on sales of gasoline, as every gallon brought into Wisconsin must be inspected and a fee paid therefor. The actual gallonage in May was 19,334,550, or about 23 per cent more than in the same month in 1923.

WITH THE ASSOCIATIONS

Outing at Philadelphia

PHILADELPHIA, July 7.—This year's outing of the Motor Truck Association, of Philadelphia, preceded by a great truck parade through the city's streets, was pronounced a huge success. The outing was held at the Northeast Shrine Club, Fox Chase, where the program committee had provided an extensive list of field contests, a baseball game between the Owners and Operators and the Dealers and Salesmen's teams. Valuable prizes were donated.

The Owners and Operators defeated their opponents in the ball game, 12 to 10, thereby winning a six-pound cake. President F. H. Williams' prize offering of a handsome silver loving cup for the truck making the best appearance in the parade, was won by a White truck owned by the Congoleum Company. The miniature loving cup, offered by A. R. Miller, Troy trailer distributor, to the worst ballplayer on the field, was awarded to G. P. Callahan, chairman of the membership committee, who umpired.

Speakers at the banquet, held in the Shrine assembly hall, were President Williams, Dr. E. J. Cattell, field secretary of the Chamber of Commerce, and Frederick W. Johnson, managing-director of the Chamber of Commerce committee on public safety. All stressed the coming greatness of the motor truck.

Elect at Norfolk

NORFOLK, Va., July 7.—The following officers were elected at a recent meeting of the Norfolk Automobile Dealers' Association:

President, E. E. Springer; Vice-President, B. R. Wrenn; Treasurer, J. Gilbert Grubb; Secretary, Fred N. Crouch; Executive Secretary, C. L. Shultz; Directors: H. H. Johnson, R. C. Taylor, Harry McTighe, C. E. Wright and I. B. Wicks.

The association is making plans that call for an extension of policies in the direction of better co-operation in matters of the local trade's protection.

Taxicab Association

ATLANTA, Ga., July 7.—At a meeting of the owners of taxicab companies from various parts of Georgia held in Atlanta recently, a state-wide organization known as the Georgia Cab Association was permanently formed, the object of the association being to promote the welfare of the taxicab business in the state, create a better feeling of friendship among competitive operators, and appoint a legislative committee to combat unfavorable measures that may be introduced before the Georgia State legislature, now in session. This committee will work in co-operation with the legislative committee of the Atlanta Automobile Association.

A. L. Belle Isle, prominent Ford dealer

in Atlanta, and head of the Black and White Cab Co., was elected president of the new association. A. L. Tate of the Yellow Cab Co., and E. E. Harwitz of the Atlanta Baggage & Cab Co., both of Atlanta, were elected vice-presidents; William E. Saunders, also of the Atlanta Baggage & Cab Co., secretary, and J. W. Hinchcliffe, of the Checker Cab Co., treasurer.

Soon in New Home

BALTIMORE, July 7.—Members of the Baltimore Automobile Trade Association, Inc., are getting ready to move into a handsome new home which they recently acquired and are much pleased with the record their organization has made.

The new quarters, located at 1200 St. Paul street, directly on a corner, was bought outright and the association paid cash for it.

The new home will be occupied about August 15. The building is a four-story structure with a frontage of 22 feet and a depth of 86 feet. In addition to the large offices where the work of the association will be carried on there will be a number of meeting rooms and a recreation hall. There also will be several bedrooms which members of the automotive trades in other cities will be invited to occupy as their quarters while in Baltimore.

The location is ideal, being within two blocks of Union station, one block from the Belvedere hotel and two blocks from "Automobile Row."

Urge Safety First Plan

PEORIA, Ill., July 7.—The Illinois Automotive Trade Association is urging members to be wary of strangers who claim to represent detective associations, collection service, advertising schemes and various official appointment offers. The state association asks all dealers not to patronize such concerns until their reliability and financial rating can be investigated by the state organization.

All such cases should be promptly reported to C. W. Coons, secretary-manager at Peoria. If reliable and worthy of patronage, indorsement will be given by the association. If unworthy, a contrary report will be forwarded.

Form Booster Club

SAN FRANCISCO, July 7.—Forty automotive factory executives who are located on the Pacific coast have joined the Booster Club movement and organized Pacific Booster Club No. 10. Three booster club meetings have already been held, the last one being recently in San Francisco.

The San Francisco meeting was attended by factory men from the entire Pacific coast. Two men traveled 800 miles to be present. A complete policy

was outlined at the meeting, which included the approval of official hotels in various coast cities which would be designated as booster headquarters.

Officers of the Pacific Coast Booster Club are: President, F. M. Crill; vice-president, Lee H. Craig; treasurer, J. A. Gallagher; secretary, George H. Mosel.

Open Headquarters

CHICAGO, July 7. — The National Standard Parts Association, which was launched at a meeting in Detroit, May 25, has opened headquarters at 2204 South Michigan avenue, Chicago. A. Johannsen, organizing secretary of the association, is in charge. The association is conducting a campaign with the hope of effecting permanent organization at a meeting to be held in Chicago in November.

New Association Home

RICHMOND, Va., July 7.—Richmond's Automotive Trade Association has purchased a new home in the finest part of the country around Richmond, and shortly will abandon Aqua Vista, which has been its headquarters for the last few years. The new home is both more accessible and in a much better section of the country. It offers fishing and hunting facilities, and can be reached by an excellent road.

The new property has a fine old colonial mansion on it, and this will be remodeled into a club house.

Hold Housewarming

ST. LOUIS, Mo., July 7.—Many leading members of the automotive industry in St. Louis attended a housewarming in the redecorated offices of the St. Louis Automobile Dealers' Association. Although the location of the offices has not been changed, they have been entirely refurnished in mahogany.

The invitations to the affair were signed by F. C. McDonald, president of the association; George M. Berry, vice president; Sam B. Ward, secretary and treasurer, and Robert E. Lee, manager.

Report on Detour

COLUMBUS, O., July 7. — A condensed report showing all road construction and detours throughout the state is being issued by the Ohio State Automobile Association. These detour bulletins, it was announced by Secretary Chas. C. Janes, are now available to all Ohio State Automobile Association clubs, and thus more than 100,000 motorists will be able to benefit by the information.

Claim Largest Club

CORNING, N. Y., July 7.—The Corning (N. Y.) Automobile Club, which has the largest membership per capita of any club in the United States, had on June 10 a membership of 3,301, an increase of 1,322 over last year. The increase alone is more than any club in New York state.

BUSINESS NOTES

The Des Moines branch sales organization of the R. M. Hollinghead Co., Camden, N. J., held a convention in Des Moines at the termination of a special Iowa campaign for the "Whiz" automobile products. R. L. Mitchell, Camden, directed the campaign and among the branch visitors at the convention were: W. D. Jones, Jr., Chicago branch; W. B. Bowers, Kansas City branch; W. L. Lushbaugh, Des Moines branch.

The A. H. Petersen Mfg. Co., 1614 Fratney street, Milwaukee, manufacturing the "Hole-Shooter," an electric portable drill, used in automobile factories, garages, etc., has filed schedules in answer to involuntary bankruptcy proceedings. The plant, built three years ago, was damaged by fire in December, and gutted by a second fire in April. A. H. Petersen, chief officer and owner, has been confined by illness several months. Liabilities of \$184,634 are admitted and assets of \$309,353 claimed. The assets included an item of \$125,000 representing insurance claims which remain unsettled.

The Board of Directors of the Black and Decker Manufacturing Company, Towson, Md., on June 19, held its regular quarterly meeting for the second quarter of 1924. The usual two per cent dividend on preferred stock as well as a two per cent dividend on common stock were declared. In addition to maintaining the payments of the preferred dividends the company has also paid at the rate of eight per cent per year on its common stock.

At the meeting of the Board of the C. G. Spring and Bumper Co., on June 20th, a dividend of five cents a share was declared payable August 15, 1924 to common stockholders of record at the close of business August 7, 1924.

The buildings of the Pan-American Motors corporation, Decatur, Ill., for which the Millikin Trust Company of Decatur, is trustee, were sold at auction recently. The only bid was one of \$30,000 from J. M. Brownback. While far below expectations, it is expected that the court will order it accepted. The appraisal on the buildings was \$125,000. They cost \$115,000 when materials and labor were much lower than at the present time.

The company owns seven and one half acres of land which will be sold later. Creditors of the company have been paid 12½ per cent on their claims and it is estimated when the final distribution is made, that they will receive about fifty per cent.

The Zinser-Backstrom Co., 604 East Jefferson street, Joliet, Ill., has been incorporated to engage in the automobile repair business and handle supplies. Its stock of \$10,000 has been bought by Irving W. Zinser, Roy Backstrom and Fred R. Adams. Battery and ignition repairs will be specialties.

The Rushville, Ill. Motor Company has been incorporated to handle automobiles and accessories, with \$10,000 capital. The incorporators are William L. Park, Chicago; P. Jay Park, Rushville; Laura L. Park, Chicago; Charles A. Dill, Chicago and Mary Yost Dill, Chicago.

The Craveroil Service of Maryland, Inc., 703 Linnard street, Baltimore, has been incorporated with capital stock of \$5000 to deal in Craveroil products and other accessories. The incorporators are: R. B. Gerhardt, William G. Curren and E. M. Brown.

The Stricker Motor Co., 5 North Stricker street, Baltimore, has been incorporated with \$10,000 capital stock by James G. Gardill, Ollie F. Oehler and Eugene Gamble.

Reports filed with the Common Pleas Court by Receiver P. A. Lewis show that net income of the Kelly-Springfield Motor Truck from Dec. 16 to Dec. 31, 1923, totaled \$190,049 from a total net sales of \$2,046,153. An inventory and appraisal taken by order of the receiver place the value of the real estate and machinery under mortgage at \$571,584; other property not included in mortgage, \$393,274, and miscellaneous equipment in branches in other cities, \$1,000,228.

The De Luxe Automatic Cleaner Co., Cleveland, O., has been chartered with an authorized capital of \$5,000 to manufacture, buy, sell and deal in automatic windshield wipers and other accessories. Incorporators are: Albert B. Leiton, Clarence K. Snyder, John Vintila, Axente Chirca and F. J. Schraner.

George W. Bobb, who for some time has operated the Bobb Chevrolet Co. on E. Whittier street, Columbus, O., has with R. H. Bobb, Alice S. Bobb, J. S. Schneider and Virgil K. Cameron, incorporated under the same name with an authorized capital of \$50,000. The company handles motor cars, parts and accessories. A service station will also be maintained in their new building, which is now under construction at 990 E. Parsons avenue. A long time lease has been secured on this building.

The R. E. Schlei Co., 764 32nd street, Milwaukee, will build a \$30,000 public garage, with sales and service features, at 3025-3029 North avenue.

The Walker Mfg. Co., Racine, Wis., specializing in the manufacture of lifting jacks and similar automotive equipment, is erecting a two-story extension to its plant, to house its administrative departments. When this is completed a large area on the ground floor of the plant, now used for offices, will be released to the manufacturing departments, and a considerable increase in the output of jacks will be effected.

The Stanek Tool & Mfg. Co., of Milwaukee has been incorporated with \$20,000 capital to manufacture tools, dies, automobile and hardware specialties, mechanical appliances, etc. Principals include Edward J. Stanek and Arthur J. Seger, formerly of the General Tool & Mfg. Co., 382 Fourth street, Milwaukee.

As another step in the reorganization of the affairs of the Gillette Tire Co., of Eau Claire, Wis., which has been conducted by a creditors' committee for a year or longer, the Gillette Tire & Rubber Co. has been incorporated under laws of Wisconsin with a capital of 500 common shares without par value. C. E. Blake, E. H. Pett and J. J. Martin appear as incorporators. The affairs are generally being worked out on a satisfactory basis. Meanwhile the plant is being operated steadily and no difficulty is experienced in marketing the entire output.

Hugh H. Greenfield has been appointed receiver for Carl Craig of Conneautville, Pa., dealer in automobiles and supplies. An early estimate of liabilities places them at \$15,000 with only a small portion of this total of assets.

The Standard Oil Co. (Indiana) has started work on a new private garage and service station in Milwaukee, to cost \$100,000. It is situated at Barclay and Walker streets. The Milwaukee district offices are at 68 Wisconsin street.

The Buffalo Truck & Tractor corporation, of Clarence, New York, filed a voluntary petition in bankruptcy listing its total assets at \$66,632.94 and liabilities at \$271,232.47. In the liabilities are secured claims of \$58,662.25 and unsecured claims of \$159,646.49. The greater part of the assets are real estate, \$32,750; machinery and tools, \$9,000; patents, copyrights and trademarks, \$5,000.

Lorenzo Smith and Co., 126 East Broadway, Salt Lake City, Utah, has failed, with liabilities amounting to \$27,072.05 and assets of \$8,424.00. The firm did a tire, battery and general auto supply business; and had in operation for several years.

Effective July 1 it is announced that the firm name of Nevins & Darling, 80 Mangum street, Atlanta, Ga., was changed to Darling & Upshaw, with headquarters at 411 Georgia Savings Bank Bldg. that city. The interest in the firm held by Mr. Nevins is said to have been acquired by E. N. Upshaw.

The Kansas City, Clay County and St. Joseph Auto Transit Company of Kansas City, Mo., has been incorporated with 400 shares of no par value. The company will engage in general motor bus transportation and will handle passengers and freight. The incorporators are Robert P. Woods, Charles W. Ford, William S. Tuley, Ross S. Mahan and James A. Weimer.

The Hampden Rubber Company, and the Standard Tire Company, both of Springfield, Mass., have been consolidated under the name Hampden Rubber Company, Inc. The amalgamated business will be conducted in the enlarged quarters of the Tire Bldg., 385 Dwight street. The officers of the merged company are: President, David E. Newman; vice-president, Charles Broad; treasurer, Samuel Dietz; secretary, Isaac Raichelson.

Preliminary to erection of its own building for automobile accessory business, the Ozburn-Abston Company has purchased a lot at 655 Union avenue. The lot is 136 by 200 feet. Mr. Ozburn states that the plant will be under construction in the near future.

The Mayer Bumper Co., Waterloo, Ia., a new manufacturing organization, has started operation. Three floors of the plant are devoted to the bumper output and another floor is given over to the making of a special auto trunk. An output of 40 bumpers a day is recorded. B. P. Hansen, Cedar Falls, is president; P. A. Bronson, vice-president and general manager, and A. Mayer, secretary-treasurer.

The General Sales Division of the American Bosch Magneto Corp. reports a 15 per cent increase over May, 1923, and an 18 per cent increase in April, 1924, over April, 1923. An average of approximately 26 per cent increase has been reported during the five months of this year, as compared with the same five months of last year.

Summer's Coming Fails to Stimulate Salt Lake Sales

Market Flooded With Used Cars as Result of Trade-Ins—Industrial Outlook Good

SALT LAKE CITY, Utah, July 7.—The coming of real summer weather, which was later here this year than usual, did not stimulate the demand for passenger cars. Dealers are unanimous on this point. Business, taking the industry as a whole, is not so good right now as it was two or three weeks ago.

The used-car situation is not satisfactory at this writing. There have been too many trade-ins which have had the effect of flooding the market with these machines. There are, of course, individual firms that are in good shape in respect to used-cars, but taking the city as a whole the situation is not what dealers would like it to be.

While a number of firms reported their stocks in shape to permit of the purchase of new models, the industry, as a whole, did not report this. The situation in this respect might be described as fair. A few weeks ago it was feared that Utah and the Salt Lake territory generally would suffer a serious crop setback. This hurt business, but the outlook is much brighter now. It is estimated today that the crops will be only a little below normal.

In spite of the crop situation the industrial outlook in Utah is good. The new steel plant in Utah County is in actual operation now and this is going to prove a great asset to the state in the opinion of industrial leaders, bankers and others.

BUS DEMAND IN HOLLAND

WASHINGTON, July 7.—With automobile interests of the Netherlands still seeking an autobus which will meet their needs, an excellent opportunity is now offered for American machines to gain the Dutch market, in the opinion of Consul Frank W. Mahin at Amsterdam, from whom the Automotive Division, Department of Commerce, has just received a dispatch on this subject. Consul Mahin says that the rapid development of bus services in the Netherlands is one of the most interesting occurrences in European history.

PLANT TO COST \$100,000

MILWAUKEE, July 7.—The Highway Trailer Co., Edgerton, Wis., is starting work on the construction of a plant addition which will cost about \$100,000. This is in effect a partial replacement of the shops destroyed by fire July 4, 1922, with a loss of \$250,000. Only recently the company was awarded a verdict of \$48,000 damages in litigation against the public utility furnishing power for the Edgerton water supply system, which failed to function properly.

CONCERNING MEN YOU KNOW

O. L. Harrison, who since Jan. 1 has been acting general manager, has been made general manager of the Dayton Engineering Laboratories Co., of Dayton, O.

Lester Leland has resigned all of his connections with the United States Rubber Co. Mr. Leland has been vice-president or vice-chairman and member of the executive committee of the company for the past 25 years.

Joseph Steinger, formerly sales manager of the Harry Newman Co., Inc., St. Louis, later interested in the South Side Nash Co., of that city, has retired from the latter company to become sales manager of the Benjamin Motor Co., Velie and Cole distributor in St. Louis. His interest in the South Side Nash Co., was purchased by Fred Gaterman, President and William J. Wolf, vice-president of the company. Mr. Wolf becomes sales manager and P. H. Mortimer, who has been with Nash organizations in St. Louis for a number of years, has been appointed assistant sales manager.

Lou Carroll for the past eight years with the Post & Lester Co., Hartford, Conn., has been appointed manager of the new South Manchester branch of the Fuller Storage Battery Co., at 43 Oak street. The Fuller Storage Battery Co. has also established new branches at Branford and Milford which operate under the New Haven branch.

H. F. Young, for many years connected with the Philadelphia branch of the Stanley steamer organization has joined Aaron G. Cohen, Inc., 187 Park street, Hartford, Conn., and will have charge of the Stanley department which has begun an active sales campaign. Full equipment has been installed to handle the service.

Dr. W. J. Harter, Buick agency head in Keokuk, Iowa, has left for Iowa City where he will manage the Buick agency in three adjoining counties.

Ralph E. Carpenter, heretofore assistant to the president of the Spicer Manufacturing Co., has been elected a vice-president of the company. Mr. Carpenter was formerly sales manager of the Taft-Pierce Co., of Woonsocket, R. I., and later assistant to the president of the Aluminum Castings Co. and manager of its experimental laboratories.

D. Leo Hendrik Bakeland, president of the Bakeland Corp., president of the American Chemical Society and Professor of Chemical Engineering in Columbia, has been made a commander of the Order of Leopold by King Albert of Belgium.

H. J. Bosshart has sailed from New York for South America to make an extensive trip in the interests of North East Service, Inc., and the North East Electric Co. His first point of call is Lima, Peru, from which city he goes to Valparaiso and Santiago, Chile, thence across the Andes to Buenos Aires, Montevideo and eventually to Brazil. After completing the South American itinerary Mr. Bosshart is going to visit all important cities in South Africa, Australia and New Zealand. His main purpose is the extension of the North East service organization in those places where North East equipped cars are in use.

Edward M. Dahill, Hartford, Conn., a successful truck salesman identified with the Mack organization has been elected president of the street board of the city of Hartford.

R. T. Bassett, founder of the Presto Distributing Co., Hartford, Conn., has disposed of his holdings in that concern and joined A. C. Whitefield, Inc., as New England sales manager.

O. E. Nonn has been appointed assistant sales manager of the St. Louis Chevrolet district. He has been handling the city sales department and has been with the Chevrolet organization since the assembling plant was built in St. Louis. N. B. Roys, who formerly held the position of assistant sales manager, has been sent to Detroit in the sales promotion department.

C. Harold Wills, president of the Wills Sainte Claire has returned from a trip to Europe. While abroad he investigated the possibilities of the European market for Wills Sainte Claire cars. Mr. Wills declared that automotive conditions are much better in Europe than in the United States at the present time.

J. Fred Woodruff, general manager of the Campbell-Ewald Co., left Detroit a few days ago with Mrs. Woodruff to attend the international advertising convention in London. After the convention Mr. Woodruff will spend some time in studying business conditions in Great Britain and on the continent.

W. S. Mefford has been appointed distributor of Republic Motor Truck Co., at Toledo, Ohio,

his territory comprising a large part of Ohio and Michigan district surrounding that city. The company will make a special factor of its parts service in developing the business of the territory.

Sidney A. Webb, who for nine years was manager and buyer for Ozburn-Abston & Co. Memphis, Tenn., and Atlanta, Ga., now is associated with the Odell Hardware Co. of Greensboro, N. C. in the capacity of general manager and buyer for the concern's Wholesale Equipment Department.

E. W. Brown and Horace Howell, of the International Harvester Company, were hosts of Rockford, Illinois, Rotarians on an inspection visit at the Rockford plant recently. J. L. McCaffrey, Chicago district manager of the company, and head of the motor truck department, explained points related to the company's truck.

Max Knauss, a partner in the Kenmax Auto Supply Co., of Ogden, Utah, who was seriously injured in an automobile accident two months ago and spent some time in the hospital, is working again, fully recovered.

Walter Zimmerman, manager of the Dallas, Texas, Oldsmobile branch since November, has been transferred to Cincinnati, Ohio, to take charge of the Olds branch house. Frank Williams, who has been in charge of the branch house at Shreveport, La., will succeed Mr. Zimmerman at Dallas.

Announcement has been made by H. H. Rice, president and general manager of the Cadillac Motor Car Company, Detroit, of the appointment, effective June 16, of Samuel Owens Van Arsdale as divisional comptroller of the Cadillac company to fill the vacancy occasioned by the recent death of Hebert J. Lount. In Mr. Van Arsdale's business experience he has specialized in financial lines. He served for a number of years as traveling auditor for the du Pont company and as assistant auditor for the General Motors corporation. Prior to his recent appointment, he has been stationed at Indianapolis, where he was supervising financial interests of the General Motors corporation. In his new position he will occupy offices at the Cadillac factory.

Robert S. Miner, Hartford, Conn., inventor and patent holder on various successful radio devices returned to S. A. Miner, Inc., Hartford Pierce Arrow distributor on July 1. Mr. Miner returned to the firm in which he relinquished his holdings two years ago when he devoted all his time to radio equipment development. His father, S. A. Miner, founder of the business, is president of the corporation. Robert S. Miner will handle the wholesale end of the business and will take over much of the detail formerly handled by his brother, William H. Miner, who was forced to retire from the business temporarily owing to illness.

Colburn Standish has been appointed to the national sales staff of Walker & Co., Detroit. Mr. Standish is well known in Detroit through his connection with the Morgan & Wright Co. which later was merged with the United States Tire Co. He has been Detroit district manager and factory representative for U. S. and recently has been sales manager for the Mailometer Co.

Announcement is made by S. deB. Keim, general sales manager of Rolls-Royce of America, of the removal of his offices from the Springfield, Mass., works, to the Colonnade Building, which houses the New York Rolls-Royce branch at Fifty-eighth street, off Broadway. Rolls-Royce now operates branch houses in Boston, Cleveland, Chicago, San Francisco and Los Angeles, aside from the New York City and Newark branches, and the new arrangement will afford greater convenience and attention to visitors from these districts than was heretofore possible.

Fred P. Howard has been appointed District Sales Manager for the Eastern District, by the Indiana Piston Ring Company, of Hagerstown, Ind., makers of "Perfect Circle" Oil-Regulating and Compression Type piston rings. The appointment became effective June 1. Mr. Howard was formerly sales manager of the W. D. Foreman Company, manufacturers of Triangle Brand Axle Shafts and Piston Pins.

The New England branch of the Yellow Cab Company in Boston has placed George A. Goodrow in charge of its territory for Worcester and Worcester County. He was formerly with Wyman & Gordon in that city. He will specialize in truck sales.

Leroy Pelletier, advertising manager of the Rickenbacker Motor Car Company, addressed the Greater Buffalo Advertising Club at its meeting on June 17.

The Washington Motor Sales Co., Madison, Wis., Star and Durant dealer, has announced the appointment of Francis Holmes as general manager.

U. S. Judge Holds Hall Does Not Infringe Emery Patent

Auto Hone Company, Which Loses Ruling, Announces It Will Appeal Case

TOLEDO, July 7.—Judge Westenhaver of the United States District Court has handed down a decision in the case of the Auto Hone Co. of Buffalo against the Hall Cylinder Hone Co. of Toledo, holding that the latter does not infringe the Emery patent, controlled by the Auto-Hone company.

The device in question is a portable grinder primarily used in truing-up out-of-round cylinders and is operated with a portable electric drill. In its decision, the court held that the Emery patent is valid but not infringed, and continues, saying:

"Emery is not entitled to claim any and all means of mounting abrading members so as to make them rotatable about the axis of the shaft and radially distant therefrom, but merely the means disclosed in his patent or the substantial equivalent thereof. The omission from defendant's device of the control levers and wedge cone, the position of which limits or controls the swinging of the arms and permits the adjustment and readjustment of the radial distance of such arms from the shaft without the substitution thereof of any substantial equivalent, precludes infringement. Moreover, there is an entire lack of interchangeability between the novel elements of the two devices. Emery would be inoperative without the levers and adjusting cone. Defendant's device would be inoperative with them. Interchangeability of parts is a standard test of infringement, and when not interchangeable, the presumption against infringement is strong."

The Auto Hone Co., admitting that the Hall company has won the first round, declares that it expects to appeal from Judge Westenhaver's decision.

RACINE COMPANY ENLARGING

RACINE, Wis., July 7.—The Belle City Malleable Iron Co. of Racine, Wis., one of the largest makers of malleables for the automotive industries, has decided to prosecute with vigor its plant replacement and enlargement program, covering five years, of which two years' work has been completed. Ground has been broken for the second unit of the foundry, the first of which was finished about a year ago, with a new annealing shop, core-room, etc. Plans have also been completed and work started on a material storage building, 80x133 feet. C. S. Anderson is general manager. A. A. Wickland & Co., Chicago, are consulting engineers; and P. M. Adams, the resident architect in Racine.

IN THE RETAIL FIELD

The Peerless Motor Car Co. has established a Peoria, Ill., branch again with C. P. Heffley of Chicago in charge. Mr. Heffley has secured salesrooms at 1820 Main street.

A. H. Short, formerly vice-president of the Banting Machine Co., purchased the business of the Rosenberger Motor Sales Co., 421-423 Main St., Toledo, and opened a general sales and service agency for Buick line on July 1. He renamed the firm the Short Motor Sales Co.

New Flint dealers: The Baltimore Republic Truck Co., 131 W. North Ave., Baltimore, Md.; Rashid Motor Sales Co., Streator, Ill.; Wright Auto Co., Gaylord, Mich.; Homer Roberts, 18.6 Vine St., Kansas City, Ind.; Van Slyke Motor Co., 323 Ohio St., Terre Haute, Ind.; L. W. Rogers, Ord, Nebr.; Brandt Flint Co., Box No. 546, Virginia, Minn.; Calking Motor Co., 623 2nd Ave. N., Fargo, N. D.; L. J. Shick Motor Sales, 3519 Lincoln Ave., Chicago, Ill.; Kennett Flint Company, Kennett Square, Pa.; H. & M. Motor Sales Co., Inc., Mt. Union, Pa.; Chester Flint Co., 4th and Edgemont Ave., Chester, Pa.; N. J. Foss & Co., Cornish, Me.; McAndrew's Garage, 543 White Plains Road, Tuckahoe, N. Y.; Smith Motor Co., Roanoke Rapids, N. C.; L. Herbert Lindsay, Antrim & Bennington, N. H.; Ames & Wall, Laramie Wyo.

The Lamar Chevrolet Company of Paris, Texas, has been incorporated. The capital stock is \$15,000. Among the incorporators are S. W. Campbell, L. A. Tittle and D. E. Griffin. The company will retail and distribute Chevrolets in Paris and surrounding country.

The Korbel Motor Co., 6520 Greenfield Avenue, West Allis, suburb of Milwaukee, has been appointed a community dealer in the Star and Durant.

The Voell Auto Sales Co., Fond du Lac, Wis., Hudson and Essex dealer, has been appointed territorial distributor of the Cadillac for three counties.

A. R. Snook, South Hill Garage, Burlington, Iowa, has taken the Rollin Agency.

New Nash dealers: W. H. Crowder, Barnesville, Ga.; Frazier McDonald, Oneida, Tenn.; Deane & Chandler, Livermore Falls, Me.; Joseph A. Picard Motor Sales, Cortland and Blackstone Streets, Jackson, Mich.; Roy Briggs, Sugar Grove, Pa.; Nash Stover Motor Company, Merrick Road, Baldwin, L. I.; Nash Motor Sales of Rockville Centre, Freeport, L. I.; Taylor & Otty, Castleton; J. Franklin Ryan, P. O. Box 334, Katonah; The Grundy Nash Motor Company, Grundy, Va.; Michaels Garage, Penns Grove, N. J.; Lumberport Garage, Lumberport, W. Va.; W. J. Henry's Garage, Adamsburg, Pa.; Smithton Auto Repair Company, Smithton, Pa.; Jos. H. Getsinger, 131 Warren Avenue, Barnesville, O.; J. L. Lipsett & Son, Sault Ste. Marie, Mich.; Brillion Sales Company, Brillion, Wis.; East Street Garage, Sault Ste. Marie, Ontario.

A grassy lawn under shady trees, hedged with attractive shrubbery, is the idea of E. Gordon Perry, Dodge Bros. dealer and distributor at Dallas, as to an effective salesroom for used cars. Perry has a half block of property adjoining his regular salesroom and repair shops. This half block was planted in grass last year. The trees were trimmed up and the shrubbery around the property made more attractive. This month, when everything was green and the birds were singing in the trees, Mr. Perry drove some 30 or 40 used cars out on the green space, stationed a corps of salesmen with them and let the people do the rest. Mr. Perry has been selling many used cars this season. He attributed a great part of his success in the used car business to his new out-door salesroom. He will operate it all summer.

The Iowa Wind Mill and Pump Co., Cedar Rapids, Ia., has been appointed as distributor of the Wills Sainte Claire line.

Employees of the Mendenhall Motor Co., Ford and Lincoln dealer in St. Louis, held their annual parade and picnic at Hartwig's Grove, Black Jack, Mo. Mr. and Mrs. William Mendenhall attended as guests. Sixty-nine automobiles carried the employees to the picnic grounds. A program of 35 events provided the entertainment and prizes were awarded in each.

Owen-Basket Co., St. Louis Ford dealers, have opened a special Lincoln sales and service building at 3318 Washington avenue. Albert L. O'Neil will be in charge of the new department. The building covers a lot 60x150 feet. An addition has been built to provide an attractive waiting room for customers.

The following have been appointed as new Wills Sainte Claire dealers: J. H. Lawler, Lapeer, Mich.; G. W. Sparling, Capac, Mich., and Anstock Motors Corp., Greenwich, Conn.

Pyramid Products, Inc., Toledo, O., has been chartered with an authorized capital of 500 shares, no par value designated, to manufacture, buy, sell and deal in automobile parts and accessories. Incorporators are: John W. Winn, Jr., A. T. Goorley, R. W. Shumaker, George R. Effler and Thomas O. Marlair.

The State Ignition & Battery Co., Cleveland, O., has been incorporated with a capital of \$10,000, to buy, sell and deal in autos, batteries, supplies and equipment. Incorporators are: M. P. McCabe, H. A. Miller, Ray T. Miller, M. J. Buelow and G. M. Horn.

The Wilson Motor Car Co., of St. Louis, distributors for the Haynes and Dort lines, have taken over the distribution of the Stutz in St. Louis. George A. Krauss is president of the Wilson Co., and H. Claude Merry, secretary and sales manager. The company has been in business in St. Louis since August, 1917. Its location is 2921 Locust street.

Southwest Nash Co., St. Louis distributors of the Nash car, has adopted the system of disassembling used cars which are judged by them to be unfit for rebuilding for future use. Rather than turn them over to junk dealers and take a chance on the junk dealer fixing them up to sell again to customers who would not be satisfied with the service the Southwest Co. takes the car apart, discards those parts which are unfit for further use and places those parts which are useable in separate bins to sell at reduced prices.

The Biteman Used Car Co., 155-59 E. Market street, Akron, O., has been chartered with an authorized capital of \$10,000 to buy and sell used cars. Incorporators are: N. O. Mather, R. H. Nesbitt, W. L. Willkie, G. L. Keller and G. M. Neal.

The Hunt-Elliott Motor Sales Co., 500 E. Market street, Warren, O., has been chartered with a capital of \$10,000 to buy and sell autos, equipment and accessories. Incorporators are: D. W. Hunt, Pauline Hunt, R. F. Elliott, Alice E. Elliott and Robert Foxall.

The Albertus Motor Sales Co., Defiance, O., has been incorporated with a capital of \$50,000 to buy, sell and deal in autos, supplies, parts and accessories. Incorporators are: R. C. Albertus, John W. Winn, Gertrude Hughes, L. B. Abele and M. A. Goller.

During the month of March the Dominion Motor Company, Winnipeg, Man., delivered more cars than any single Ford dealer in Canada. They totaled 118 automobiles. To four top notch salesmen were credited the sale of 113 machines.

Chevrolet cars are now being handled in North Toronto, Canada, by the Lawrence Park Garage.

Consolidated Motors, Winnipeg, have recently added the Maxwell line in addition to featuring Reo, Chevrolet and Gardner motor cars.

Ira Telford, Buick dealer at Oconto, Wis., has moved into his new sales and service building, 40x100 feet, two stories and basement.

The Studebaker Sales & Service Co., Kenosha, Wis., of which W. F. Russell is owner, has moved from 603 Milwaukee avenue into a new home at 464 Park street, in a large building erected for the Long Motor Co.

The Stratton-Keenan Company, 4628 Washington boulevard, Chicago, has been appointed Haynes distributor in the Chicago district.

An enlargement of the service building of the North Side Nash Co., St. Louis Nash dealers, has recently been completed, giving the company added facilities for its maintenance division. Four mechanics have been added to the company's staff. Frank Hazelrigg, service manager, instituted the "call for and deliver" service in the company's business and it was due to the increase in demand for this service which made it necessary for the additional help and equipment.

A new used car show room, so designed and lighted that a prospect can make out every detail of the finish of an automobile at night, has been opened by the Newell Motor Car Co., Paige and Jewett distributor in St. Louis. "A man can come in here and see just what he is buying," says James E. Newell, president of the company who has taken personal charge of the new department.

The Curtis Auto Co., Milwaukee, Reo distributor, completing a \$150,000 sales and service building at Broadway and Martin streets, has contracted for a complete equipment of S. F. Bowser & Co. pumps, tanks, filters, etc.

The Bradshaw Chevrolet Company of Dallas, Texas, has completed and occupied its new sales and service building. The building occupies a ground space 100 by 100 feet and was completed at a cost of some \$40,000.

Underwriters Defer Discount Rule on Coincidental Locks

Agree to Year's Notice Before Granting Preferential Credit on Cars Thus Equipped

NEW YORK, July 7.—General Manager Alfred Reeves of the National Automobile Chamber of Commerce has notified members of that association that the National Automobile Underwriters Conference has agreed to give the industry one year's notice before granting any preferential credit on cars fitted with coincidental anti-theft locks which operate automatically when the ignition is shut off.

The industry through its Insurance chairman, has been opposed to the granting of a superior theft rate discount on coincidental locks until further investigation. This type of lock is comparatively new and meets with the approval of the underwriters, who feel that it will make owners more careful if the lock operates when the ignition is shut off, compelling the owner to resort to his key before he can restart his engine.

Car manufacturers point out that such a lock will not permit of an engine idling in cold weather and with the lock operative at the same time, thus robbing the owner of the protection of a lock, while it also is pointed out that if a car so equipped stalled on a railroad track it would be necessary for the driver to use a key to restart his engine, thus losing time that might result in an accident.

As the matter now stands, the underwriters have approved several of this type of lock, but because of the feeling in the automobile industry they will not offer special discounts at the present time.

The underwriters also have agreed to discuss with the Metzger committee early next month the proposal of the insurance people to secretly mark the change number on locking devices as a theft preventive. It is felt that this would work a hardship on an owner who has lost a key and does not know the change number of his lock.

\$5,000 DEALER POLICY

QUEBEC, Que., July 7.—To obtain a license to sell motor vehicles in the Province of Quebec, motor dealers must deposit with the provincial treasurer a guarantee policy to the extent of \$5,000. This is the amount which has been decided upon by the provincial treasurer, as meeting the requirements in connection with the amendments passed at the last session of the legislature, to put an end to dealings in stolen cars. This bond will be utilized to reimburse the owner of an automobile who locates it in possession of another man, who has apparently purchased it in good faith, and consequently to reimburse the last possessor to get his automobile back.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Chicago.....Jan. 24-31, 1925.....National Automobile Chamber of Commerce.

Detroit.....Jan. 17-24, 1925.....Detroit Automobile Show, Detroit Dealers' Assn.

Green Bay, Wis.....Aug. 25-30.....Automotive Division, Association of Commerce, W. F. Kerwin, Manager.

Kansas City, Mo.....Feb. 7-14, 1925.....Kansas City Motor Car Dealers' Association Show.

Milwaukee, Wis.....Aug. 25-30.....Milwaukee Automotive Dealers' Association, Fall Show, Bart L. Ruddle, Manager.

New York.....Jan. 3-10, 1925.....National Automobile Chamber of Commerce.

Sacramento, Cal.....Sept. 1-10.....State Agricultural Society, C. E. Paine, Manager.

Toronto, Ont.....Aug. 23-Sept. 6.....Canadian Automotive Equipment Association and the Automotive Industries of Canada, Gib Robertson, Secretary.

FOREIGN SHOWS

London, Eng.....Oct. 16-25

Paris, France.....Oct. 2-12.....Passenger Car and Accessory Show

CONVENTIONS

Detroit, Mich.....Oct. 22-24.....S. A. E. Production Meeting and Exhibition.

Selma, Ala.....July 21-22.....Midsummer meeting Alabama Automotive Traders' Association.

New York City.....Jan. 7, 1925.....New York Show, Convention N. A. D. A.; Hotel Commodore.

Chicago.....Jan. 26-29, 1925.....Eighth Annual Convention, N. A. D. A., Hotel La Salle.

RACES

Sept. 1.....Altoona, Pa.....Altoona Speedway Assn. 250 Miles

Sept. 1.....Colorado Springs, Colo.....Pikes Peak Highway.....12½ Miles

Oct. 4.....Fresno, Cal.....Fresno Speedway Assn. 150 Miles

July 4.....Kansas City, Mo.....K. C. Speedway Assn. 250 Miles

Oct. 19.....Kansas City, Mo.....K. C. Speedway Assn. 250 Miles

Nov. 29.....Los Angeles, Cal.....L. A. Speedway Assn. 250 Miles

Sept. 7.....Monza Track, Milan Italy.....Italian Grand Prix

Sept. 13.....Syracuse, N. Y.....Horace P. Murphy.....100 Miles

23 Years Ago This Week In Motor Age

(From MOTOR AGE of July 11, 1901)

Pacific Coast Record

SAN JOSE, July 9.—H. T. McKnight of New York broke the Pacific coast record for automobiles here by driving his machine over the Monterey road course one mile in 1:12. The road was in only fair condition.

To Test Mail Wagon

The Maryland Automobile Co. of Luke, Md., has just completed a small automobile United States mail wagon for the government, which will shortly be given a test.

News Notes

The Willoughby-Owen Co. of Utica, N. Y., is working on an order for 125 bodies for a maker of gasoline vehicles, and is said to have just secured an order for \$20,000 worth of goods from a New York company.

The Knox Automobile Co. is now pro-

ducing a light delivery van which it sells at \$1,000. It will be in a position to supply in numbers in about two months.

Siegel-Cooper to Use Electrics

The first big move of the Crowdus Automobile Co. since Frank H. Cooper became its president and bought out the stock holdings of earlier backers of the inventor, has just been made in the placing of an order to remodel the entire outfit of Siegel-Cooper delivery wagons and turn them into electric vehicles. The new company was organized in March and began to build the new automobiles 10 days ago. Its capital is \$150,000. Its officers are: Frank H. Cooper, president; Walter A. Crowdus, vice-president and general manager; Charles Cooper, treasurer; Worth E. Caylor, secretary.

Extends Line and Capital

About the time of the Chicago show it became known among a few people

that the National Automobile & Electric Co. of Indianapolis was preparing to manufacture a gasoline vehicle. With this end in view a new company has been organized with \$150,000 capital, known as the National Vehicle Co., and the new concern will take over the business of the old one. The directorate is practically the same. The Pumpelly battery will be used hereafter and Mr. Pumpelly is now actively connected with the business.

Show at New York

Formal notice has been given by the Madison Square Garden management of the second annual automobile show there to be held November 2 to 9. Diagrams have been issued showing 111 spaces, aside from the center of the floor, which contains a dozen more, varying in size from 700 to 1,500 square feet. The track has been omitted this year. All the center spaces will cost \$1.25 per square foot and all others \$1 each.

Prices and Weights of Current Passenger Car Models

Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price
AMERICAN "D-66"					CHANDLER SS					DUESENBERG					HATFIELD				
2985	2-p		Roadster	\$1,950	2945	2-p		Roadster	\$1,795	3200	2-p		St. "8"	\$6,500	3080	4-p		Sport Touring	\$1,775
3175	4-p		Sp. Roadster	2,050	3130	4-p		Roadster	1,785	3550	5-p		Phaeton	6,250	3225	4-p		Coupe	2,175
3260	5-p		Touring	1,695	3160	5-p		Touring	1,585	3750	7-p		Phaeton	6,750	3300	5-p		Sedan	2,350
3300	5-p		Sport	1,850	3218	7-p		Touring	1,735	3750	4-p		Sp. Phaeton	6,500	HAYNES				
3310	7-p		Touring	1,760	3250	4-p		Royal Dispatch	1,885	4000	4-p		Coupe	7,500	"60"				
3190	4-p		Sp. Touring	1,885	3380	5-p		Chummy Sedan	1,845	4350	7-p		Sedan	7,800	3520	3-p		Sp. Roadster	\$1,545
3470	7-p		Sedan	2,550	3600	5-p		Sedan	1,995	DU PONT "C"					3295	5-p		Touring	1,545
3310	5-p		Brougham	2,195	3480	7-p		Limousine	3,095	3300	2-p		Roadster	\$2,090	3590	5-p		Sedan	2,045
ANDERSON "41"					CHRYSLER					3600	5-p		Touring Sedan	3,050	3560	5-p		Brougham 4 d.	2,045
2650	5-p		Touring	\$1,195	2600	4-p		Roadster	1,625	DURANT "A-22"					HUDSON				
2675	4-p		Sp. Touring	1,445	2650	5-p		Touring	1,395	2235	2-p		Roadster	\$1,040	3300	4-p		Speedster	\$1,400
2925	2-p		Coupe	1,425	2650	5-p		Phaeton	1,495	2325	5-p		Touring	890	3425	7-p		Phaeton	1,500
2725	4-p		Coach	1,495	2650	5-p		Sedan	1,725	2325	5-p		Touring F.W.B.	940	3450	5-p		Coach	1,500
2875	5-p		Sedan	1,695	2915	5-p		Imperial Sedan	1,995	2395	5-p		Sp. Touring	1,090	3590	5-p		Sedan	2,150
2925	5-p		Sp. Sedan	1,895	2855	5-p		Brougham	1,895	2495	5-p		Coupe	1,340	3675	7-p		Sedan	2,250
Brougham 3 d.					CLEVELAND "43"					2405	2-p		Business Coupe	1,035	HUPMOBILE				
2975	7-p		Touring	1,595	2750	5-p		Touring	1,095	2605	5-p		Sedan	1,365	"R"				
2875	7-p		Sedan	1,945	2810	5-p		Touring De Luxe	1,195	2670	5-p		Coach	1,185	2595	2-p		Roadster	\$1,175
APPERSON "6"					2830	3-p		Coupe	1,295	ELCAR					2635	2-p		Spec. Roadster	1,195
2915	5-p		Phaeton	\$1,395	2840	3-p		Spec. Coupe	1,395	2560	5-p		Touring	\$995	2705	5-p		Touring	1,175
2965	5-p		Sp. Phaeton	1,600	2930	5-p		Sedan 2-door	1,395	2585	5-p		Demi Sp. Touring	1,095	2770	5-p		Spec. Touring	1,195
3400	5-p		Sedan	1,995	3040	5-p		Spec. Sedan 4 d.	1,495	2641	5-p		Sportster	1,195	2760	2-p		Coupe	1,415
3450	5-p		Sp. Sedan	2,195	COLE MASTER					2779	5-p		Brougham 3 d.	1,265	2860	4-p		Coupe	1,595
4100	5-p		Phaeton	\$2,485	3695	4-p		Volante Touring	\$2,175	2829	5-p		Sp. Brough. 3 d.	1,395	2975	5-p		Sedan	1,750
4315	7-p		Phaeton	2,535	3765	7-p		West. Tour.	2,175	"6-50-51"					2875	5-p		Club Sedan	1,425
4250	5-p		Sport Phaeton	2,900	3695	4-p		Aero-Volante	2,475	2600	5-p		Demi Sp. Tour.	\$1,220	JEWETT				
4440	5-p		Sedan	3,485	3890	4-p		Imperial Coupe	2,750	2690	5-p		Sp. Touring	1,420	2690	5-p		Touring	\$1,065
4570	5-p		Sport Sedan	3,750	3950	5-p		Bourette Sedan	3,075	2900	5-p		Sedan	1,720	2810	5-p		DeLuxe Touring	1,220
4555	7-p		Sedan	3,585	4090	7-p		Royal Sedan	3,075	2981	5-p		Sp. Sedan	1,920	2880	5-p		Sedan	1,495
AUBURN "6-43"					4150	7-p		Royal Limousine	3,175	2779	5-p		Brougham	1,490	3095	5-p		DeLuxe Sedan	1,695
2550	5-p		Touring	\$1,095	COLUMBIA					2829	5-p		Sp. Brougham	1,620	2775	5-p		Brougham	1,325
2672	5-p		Special Touring	1,295	2480	5-p		Touring	\$1,175	2007	5-p		Touring	\$1,585	JORDAN				
2772	5-p		Sp. Touring	1,365	2485	5-p		Spec. Touring	1,275	3380	5-p		Sedan	2,245	(120 in. W. B.)				
2850	5-p		Coupe Touring	1,595	2510	2-p		Coupe	1,375	3675	5-p		Sp. Sedan	2,395	3000	2-p		Playboy Road.	\$1,850
2852	5-p		English Coach	1,845	2725	5-p		Coach	1,575	3380	4-p		Brougham	1,995	3100	5-p		Touring	1,775
2932	5-p		Sedan	1,695	2810	5-p		Sedan	1,775	ELGIN					3420	5-p		Brougham 4 d.	2,385
"6-63"					CUNNINGHAM "V-4"					2940	4-p		Sportsman	\$1,895	3375	4-p		Victoria	2,385
3262	5-p		Touring	\$1,695	4600	7-p		Touring	\$6,300	2985	3-p		Coupe	2,145	(124 1/2 in. W. B.)				
3332	5-p		Sp. Touring	1,935	4500	4-p		Sp. Touring	5,800	3250	5-p		Sedan	2,345	3260	4-p		Blueboy Touring	2,095
3562	5-p		Sedan	2,445	6-p			Sedan	7,650	ESSEX					3585	5-p		Sedan	2,585
3572	5-p		Brougham	2,245	DAGMAR "6-70"					2940	4-p		Sportsman	\$1,895	3490	7-p		Sedan	2,785
BARLEY "6-50"					3800	4-p		Sp. Touring	\$3,500	2130	5-p		Touring	\$900	KING				
2750	5-p		Touring	\$1,395	4200	4-p		Sedan	4,500	2305	5-p		Coach	1,000	(120 in. W. B.)				
2800	5-p		Sp. Touring	1,495	DANIELS					2130	5-p		Touring	\$900	3428	2-p		Sportster	\$1,895
3100	5-p		Sedan	1,850	4150	4-p		Touring	\$6,800	2305	5-p		Coach	1,000	3428	4-p		Foursome	1,595
3150	5-p		Sp. Sedan	2,250	4765	7-p		Touring	6,900	FLINT "55"					3528	5-p		Touring	1,595
BUICK "Standard"					4600	4-p		Sedan	7,600	3000	5-p		Sp. Roadster	\$1,636	3645	3-p		Coupe	2,200
Prices to be announced Aug. 15					5200	7-p		Sedan	7,800	3200	4-p		Coupe	2,095	3875	5-p		Sedan	2,400
"Master" (120 in. W. B.)					3575	4-p		Sedan	2,185	3575	4-p		Sedan	2,185	3400	5-p		Road King Sedan	1,495
3300	2-p		Roadster	\$1,275	DAVIS "71"					5-p			Touring	1,075	4-p			Sedanette	1,995
3455	5-p		Touring	1,295	2650	3-p		M. O'War Road.	\$1,395	FORD					(124 in. W. B.)				
3845	5-p		Sedan	2,095	2915	4-p		Legionaire Tour.	1,495	Without Starter and Dem. Rims					3428	2-p		Sportster	\$1,895
3675	5-p		Dbl. Serv. Sedan	1,695	2750	5-p		Phaeton	1,395	1385	2-p		Runabout	\$265	3428	4-p		Foursome	1,595
(128 in. W. B.)					3070	5-p		Sedan	1,895	1475	5-p		Touring	295	3528	5-p		Touring	1,595
3470	3-p		Sp. Roadster	\$1,675	3065	5-p		Berline Sedan	1,995	With Starter and Dem. Rims					3645	3-p		Coupe	2,200
3645	7-p		Touring	1,565	2700	5-p		Brougham	1,595	1535	2-p		Runabout	\$350	3875	5-p		Sedan	2,400
3605	4-p		Sp. Touring	1,725	"81"					2835	3-p		Roadster	\$1,695	3400	5-p		Road King Sedan	1,495
3770	4-p		Coupe	1,995	3020	5-p		Phaeton	1,695	1625	5-p		Touring	380	4-p			Sedanette	1,995
4020	7-p		Sedan	2,285	3245	5-p		Sedan	2,195	1730	2-p		Coupe	525	(124 in. W. B.)				
3940	5-p		Brougham Sedan	2,235	3050	5-p		Brougham	1,895	1915	5-p		Sedan, Fordor	685	3428	2-p		Sportster	\$1,995
CADILLAC "V-63"					3215	5-p		Berline Sedan	2,295	5-p			Sedan, Tudor	590	3428	4-p		Foursome	1,795
4190	4-p		Roadster	\$3,085	DODGE BROTHERS					2580	5-p		Touring	\$1,950	3528	7-p		Touring	1,795
4280	7-p		Touring	3,085	2513	2-p		Roadster	\$865	2520	2-p		Roadster	\$945	3645	4-p		Coupe	2,400
4200	4-p		Phaeton	3,085	2653	2-p		Spec. Roadster	1,025	2550	2-p		Radio Roadster	1,135	3875	7-p		Imp. Sedan	4,500
4270	2-p		Coupe	3,875	2610	5-p		Touring	895	2555	5-p		Touring	995	4375	7-p		Limousine	4,000
4370	5-p		Sp. Coupe	3,950	2755	5-p		Spec. Touring	1,055	2650	5-p		Tour. DeLuxe	1,045	4482	7-p		Imperial Lim.	4,700
4600	5-p		Sedan	4,400	2809	4-p		Coupe	1,375	2710	4-p		Coupe	2,750	LAFAYETTE				
4610	7-p		Sedan	3,585	2755	2-p		Coupe B	1,035	2730	5-p		Sedan	2,850	4118	7-p		Touring	\$3,250
4480	5-p		DeLuxe Sedan	4,150	2929	4-p		Spec. Coupe	1,535	2655	5-p		Demi-Sedan	2,250	4082	4-p		Torpedo	3,250
4530	5-p		Town Brougham	4,600	3050	5-p		Sedan B	1,250	2835	5-p		Tour. Limousine	2,950	4288	4-p		Coupe	4,300
4640	7-p		Limousine	4,600	3098	5-p		Sedan A	1,385	2765	4-p		Brougham	2,850	4482	5-p		Sedan	4,400
4640	7-p		Suburban	4,500	3190	5-p		Spec. Sedan	1,545	GARDNER "Series 5"					4432	7-p		Imp. Sedan	4,500
4560	7-p		DeLuxe Suburban	4,250	DODGE BROTHERS					2520	2-p		Roadster	\$945	4375	7-p		Limousine	4,000
4380	4-p		Victoria	3,275	2513	2-p		Roadster	\$865	2550	2-p		Radio Roadster	1,135	4482	7-p		Imperial Lim.	4,700
4380	5-p		Landau	3,650	2653	2-p		Spec. Roadster	1,025	2650	5-p		Touring	995	LEXINGTON				
CASE J. I. C.					2610	5-p		Touring	895	2750	5-p		Tour. DeLuxe	1,045	"Minute Man"				
3020	3-p		Roadster	\$1,840	2755	5-p		Spec. Touring	1,055	2895	5-p		Rad. Spec. Tour.	1,145	3120	2-p		Skylark Roadster	\$1,895
3050	5-p		Touring	1,885	2809	4-p		Coupe	1,375	2710	4-p		Coupe	2,750	3489	5-p		Lark Sp. Roadster	2,145
3200	5-p		Sp. Phaeton	2,230	2755	2-p		Coupe B	1,035	2730	5-p		Sedan	2,850	3195	5-p		Touring	1,895
3380	4-p		Suburban Coupe	2,480	2929	4-p		Spec. Coupe	1,535	2655	5-p		Demi-Sedan	2,250	3365	5-p		Cal. Touring	2,195
3400	5-p		Sedan	2,590	3050	5-p		Sedan B	1,250	2765	4-p		Brougham	2,850	3230	7-p		Touring	1,995
"Y"					3098	5-p		Sedan A	1,385	FRANKLIN "10 C"					3395	7-p		Cal. Touring	2,295
3975	7-p		Touring	\$2,475	3190	5-p		Spec. Sedan	1,545	258>									

Prices and Weights of Current Passenger Car Models

Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price	Ship.	Wt.	Pass.	Body Style	Price
LINCOLN					OAKLAND					REVERE					STEVENS-DURYEA				
4050	2-p		Roadster	\$3,800	2420	3-p		"6-54" Roadster	\$995	3700	2-p		"M" Roadster	\$3,200	4200	2-p		Roadster	\$8,150
4290	7-p		Touring	3,800	2510	3-p		Sp. Roadster	1,095	3500	4-p		Speedster	3,200	4400	7-p		Touring	7,500
4215	4-p		Phaeton	3,800	2485	5-p		Touring	995	3800	5-p		Touring	3,200	4250	4-p		Sp. Touring	7,750
4380	5-p		Coupe	4,400	2550	5-p		Sp. Touring	1,095	4300	5-p		Sedan	4,000	4600	4-p		Coupe	9,000
4375	4-p		Sedan	4,600	2620	3-p		Coupe	1,195					4600	4-p		Sedan	10,000	
4600	5-p		Sedan	4,700	2720	4-p		Coupe	1,395	RICKENBACKER					4800	6-p		Sedan	9,675
4660	7-p		Sedan	4,900	2860	5-p		Sedan	1,445	"C"					4800	6-p		Town Brougham	10,175
4720	7-p		Limousine	5,100	OLDSMOBILE					2815	3-p		Sp. Roadster	\$1,645	4800	6-p		Vestibule Limou.	9,675
LOCOMOBILE					2145	2-p		"30" Roadster	\$785	2880	5-p		Sp. Touring	1,595	4800	7-p		Vestibule Limou.	10,175
			"48"		2270	2-p		Roadster	885	3050	4-p		Coupe	2,095	4800	7-p		3/4 Limousine	10,175
5225	4-p		Sportif Tour.	\$7,400	2170	5-p		Touring	795	3160	5-p		Sedan	2,195	4800	7-p		Cabriolet	10,175
5525	7-p		Touring	7,400	2320	5-p		Sp. Touring	915					4-p					
5525	5-p		Victoria Sedan	9,990	2295	2-p		Cab	985					4-p					
5425	7-p		Brougham	9,990	2410	4-p		Coupe	1,075	"8"					4-p				
5480	7-p		Tour. Limousine	9,000	2570	5-p		Sedan	1,135	2815	3-p		Sp. Roadster	\$1,645					
5460	7-p		Encl. Drive Lim.	9,990	2700	5-p		Sp. Sedan	1,245	2880	5-p		Sp. Touring	1,595					
5722	7-p		Cabriolet	10,250	OVERLAND					3050	4-p		Coupe	2,095					
McFARLAN					1844	2-p		"91" (100 in. wheelbase) Roadster	\$495	3160	5-p		Sedan	2,195					
			"6" TV		1910	5-p		Touring	495	3100	4-p		Tourer	2,485					
4600	2-p		Roadster	\$5,400	2100	2-p		Touring de luxe	560	3300	4-p		Sp. Touring	2,750					
4600	4-p		Sport Touring	5,600	2200	5-p		Coupe	650					7-p					
4700	7-p		Touring	5,700	2053	5-p		Coupe sedan	655	"6-54-E" (118 in. W. B.)									
4900	4-p		Coupe	6,720						3100	2-p		Roadster	\$2,685					
5200	4-p		Tour. Sedan	6,720	"92" (106 in. wheelbase)					3300	4-p		Tourer	2,485					
5200	7-p		Tour. Sedan	6,810	2047	5-p		Red Bird	\$695	4100	5-p		Spec. Sedan	\$4,250					
5200	7-p		Sp. Sedan	6,600	5-p			Red Bird Spec.	735	4200	7-p		Suburban-Sedan	3,950					
5200	7-p		Sub. Sedan	7,000	5-p			Blue Bird	725	3650	4-p		Sport	3,650					
5100	7-p		Limousine	6,900	5-p			Black Bird	695	"4-75-E"									
5200	7-p		Town Car	9,000	5-p			Black Bird Spec.	735	3200	2-p		Spec. Speedster	3,785					
MARMON					PACKARD					ROAMER					ROLLIN				
			"34"		3165	4-p		"6" (126 in. W. B.) Roadster	\$2,785	3100	2-p		Roadster	\$2,685	2300	5-p		Touring	\$995
3470	2-p		Speedster	\$3,095	3320	5-p		Touring	2,585	3100	4-p		Tourer	2,485	2315	3-p		Coupe Roadster	1,195
3650	4-p		Speedster	3,095	3255	4-p		Sp. Touring	2,750	3300	4-p		Sp. Touring	2,750	2485	5-p		Sedan	1,295
3575	4-p		Phaeton	2,895	3400	4-p		Per. Top. Touring	2,850										
3690	7-p		Phaeton	2,895	3400	4-p		Coupe	3,275	R & V KNIGHT									
3770	4-p		Coupe	3,585	3515	5-p		Coupe	3,450										
3970	4-p		Sedan	3,985	3565	5-p		Sedan	3,375	3840	4-p		Sp. Roadster	\$2,400					
4155	7-p		Sedan	3,985	3610	5-p		Sedan Limousine	3,425	3800	5-p		Touring	2,300					
4220	7-p		Suburban	4,285	"6" (133 in. W. B.)					3850	7-p		Touring	2,375					
4100	7-p		Limousine	4,285	3430	7-p		Touring	\$2,785	4050	5-p		Coupe	3,000					
4000	7-p		Town Car	4,285	3690	7-p		Sedan	3,625	4160	5-p		Club Sedan	3,050					
MAXWELL					3765	7-p		Sedan Limousine	3,675	4165	7-p		Sedan	3,250					
			"25"		"8" (136 in. W. B.)					ROLLS-ROYCE									
2225	2-p		Roadster	\$885	3880	4-p		Runabout	3,850	4750	2-p		Roadster	\$11,400					
2250	5-p		Touring	895	3990	5-p		Touring	3,650	5000	7-p		Touring	11,450					
2470	5-p		Sp. Touring	1,055	3930	4-p		Sp. Touring	3,800	4900	5-p		Phaeton	10,900					
2325	2-p		Club Coupe	1,025	4125	4-p		Coupe	4,550	5385	7-p		Sedan	12,900					
2450	5-p		Club Sedan	1,095	4200	5-p		Coupe	4,725	5400	7-p		Limousine	12,850					
2650	5-p		Sedan	1,325	4270	5-p		Sedan	4,650	5100	5-p		Cabriolet	12,800					
MOON					4275	5-p		Sedan Limousine	4,700	5300	5-p		Salamanca Cab.	13,500					
			Series "A"		4020	7-p		Touring	\$3,850	STANLEY									
2400	4-p		Roadster	\$1,350	4275	7-p		Sedan	4,900	3775	5-p		Phaeton	\$2,750					
2410	5-p		Sp. Touring	1,295	4350	7-p		Sedan Limousine	4,950	3915	7-p		Phaeton	2,750					
2625	5-p		Sedan 2 d.	1,595	PAIGE					3777	4-p		Phaeton	1,795					
2750	5-p		Sedan 4 d.	1,695	3677	4-p		Phaeton	1,795	4135	5-p		Sedan	3,585					
"6-40"					3880	4-p		Phaeton DeLuxe	1,995	4175	7-p		Sedan	3,985					
2860	5-p		Touring	\$1,395	4040	5-p		Sedan	2,595	STAR									
2870	5-p		Sp. Touring	1,595	4128	7-p		Sedan	2,595	1700	2-p		Roadster	\$540					
2920	4-p		Coupe	1,785	4300	7-p		Sub. Limousine	2,895	1735	5-p		Touring	540					
2920	5-p		Sedan	1,795	4100	5-p		Sedan DeLuxe	2,770	1800	5-p		Spec. Touring	640					
3090	5-p		Petite Sedan	1,995	3900	5-p		Brougham 4 d.	2,175	1925	2-p		Coupe	695					
"6-50"					4285	7-p		Sedan DeLuxe	2,770	2025	5-p		Sedan	785					
2850	5-p		Touring	\$1,595	PEERLESS					2100	5-p		Spec. Sedan	935					
2970	5-p		Sp. Touring	1,695	3200	2-p		"6-70" Roadster	\$2,185	STEARNS-KNIGHT									
3120	5-p		Sedan	1,985	3325	4-p		Touring	2,185	3775	4-p		Coupe Roadster	\$1,795					
3190	5-p		Sp. Sedan	2,195	3675	5-p		Sedan	2,875	3915	5-p		Touring	1,595					
"6-58"					"8"-66					4250	5-p		Sedan	2,095					
3270	5-p		Sp. Touring	\$2,150	3980	7-p		Tour. Phaeton	\$2,690	3750	4-p		Coupe Brougham	1,895					
3510	7-p		Sedan	2,585	4300	5-p		Sedan	3,690				Brougham	2,095					
3590	5-p		Petite Sedan	2,685	4430	7-p		Berline	4,090	"6"									
NASH					4130	4-p		Victoria Coupe	3,390	3775	5-p		Touring	\$2,395					
			"41"		PIERCE-ARROW					3850	7-p		Touring	2,495					
2600	2-p		Roadster	\$915	4350	2-p		Runabout	\$5,250	4025	2-p		Coupe	3,395					
2720	5-p		Touring	935	4590	5-p		Touring	5,250	4275	4-p		Sp. Coupe	3,150					
			Touring	975	4780	3-p		Coupe	6,800	4275	7-p		Sp. Sedan	3,395					
2980	5-p		Sp. Touring	1,195	4830	4-p		Sedan	6,900	3950	5-p		Brougham	3,200					
2750	2-p		Business Coupe	1,165	4960	7-p		Sedan	7,000	STEPHENS									
3090	5-p		Sedan	1,445	4750	4-p		Coupe Sedan	6,900	104 & 20									
2910	5-p		Carrieole	1,275	4730	6-p		Brougham	6,800	117 in. W. B.)									
"6" (121 in. W. B.)					4850	7-p		Limousine	7,000	Roadster									
3030	2-p		Roadster	\$1,275	5060	7-p		Enclosed Lim.	7,000	Touring									
3530	4-p		Sport Tour.	1,645	4780	7-p		French Lim.	7,000	Sedan									
3120	5-p		Touring	1,275	4732	6-p		Landaulet	7,000	Touring Sedan									
3550	5-p		Coupe 4 d.	2,090	PREMIER					2875	4-p		Sp. Touring	\$2,250					
3550	5-p		Sedan	2,040	3710	2-p		"6-D" Roadster	\$2,885	2975	5-p		Phaeton	2,150					
3400	5-p		Spec. Sedan	1,640	3870	5-p		Open-Touring	2,885	3390	5-p		Sedan	2,800					
"692" (127 in. W. B.)					3920	7													

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL	Wheelbase (Ins.)	TIRES		ENGINE										Electrical System		Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES			Steering Gear	Rear Springs
		Standard Size (Ins.)	Ballon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Make				Make	Type and Make	Type and Make	Gear Ratio	Foot, Type and Location			Hand, Type and Location	Four Wheel Brake Type	Make	Type and Length
American.....D-66	127	33x4 1/2	No	H-Sp	91	6-3 1/2 x 5	29.40	L	C	3	PS	Str	A-K	G-D	P-B&B	War	M-Har	F-Sal	5.10	E-R	I-R	None	Lav	S-57 1/2	
Anderson.....41	115	32x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Zen	Wes	Wes	P-B&B	Dur	F-Thi	3/4 Sal	4.75	E-R	E-T	Mec*	Gem	S-58	
Anderson.....50	122	32x4	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Zen	Rem	Rem	P-B&B	Dur	F-Thi	3/4 Sal	4.62	E-R	E-T	Mec*	Gem	S-58	
Apperson.....6	120	32x4	Yes*	Fall	T8000	6-3 1/2 x 4 1/2	23.44	I	C	3	PS	Str	Rem	Rem	P-Roc	Mec	M-Thi	1/2 Col	5.10	E-R	I-R	Mec*	Lav	J-48	
Apperson.....8	130	33x5	No	Own	8	8-3 1/2 x 5	33.80	L	C	3	FP	Joh	Rem	Bij	D-Own	Own	M-Thi	1/2 Own	4.25	E-R	I-R	Mec*	Lav	J-48	
Auburn.....6-43	114	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	I	C	4	PC	Str	Rem	Rem	P-B&B	War	M-Uni	1/2 Col	4.63	E-R	E-T	Mec*	Jac	S-57	
Auburn.....6-63	122	32x4 1/2	Yes*	Weid	Spec	6-3 1/2 x 5	25.35	I	C	3	PC	Str	Rem	Rem	P-B&B	War	M-Thi	1/2 Col	4.63	E-R	E-T	Mec*	Jac	S-57	
Barley.....6-53	118	32x4	No	H-Sp	40	6-3 1/2 x 5	25.35	L	C	4	PC	Str	Del	Del	P-B&B	Ful	R-M&E	1/4 Col	5.10	E-F	I-R	Hyd	Jac	S-56	
Buick....."Standard"	114 3/4	31x4 3/4	Yes	Own	Sta	6-3 x 4 1/2	21.60	I	C	4	PS	Mar	Del	Del	D-Own	Own	M-Own	3/4 Own	4.66	E-F	I-R	Mec	Jac	S-55 1/2	
Buick....."Master"	128	32x5 7/8	No	Own	6	6-3 1/2 x 5 3/4	27.34	I	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	F-Own	4.10	E-F	I-R	Mec	Jac	V-46 1/2	
Cadillac.....V-63	132	33x5	No	Own	63	8-3 1/2 x 5 1/2	31.25	L	C	3	PC	Mar	Del	Del	D-Own	Own	R-Spi	F-Own	4.50	B-F	I-R	Mec	Own	N-54	
Case.....JIC	122	32x4 1/2	Yes	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sne	1/2 Col	4.90	E-R	I-R	Hyd*	Jac	S-54 1/2	
Case.....Y	122	32x4	No	Cont	6T	6-3 1/2 x 5	33.75	L	C	4	PC	Ray	Del	Del	D-Own	Own	R-Sne	3/4 Col	4.40	E-R	I-R	None	Jac	S-56	
Chalmers.....Y	117	32x4	No	Own	6	6-3 1/2 x 4 1/2	25.35	L	A	3	PS	Str	A-L	A-L	P-Mec	War	M-Mec	1/2 Tim	5.13	E-R	I-R	Hyd*	Gem	S-57	
Chalmers.....Y	122	33x4 1/2	No	Own	6	6-3 1/2 x 4 1/2	25.35	L	A	3	PS	Str	A-L	A-L	P-Mec	War	M-Mec	1/2 Tim	5.13	E-R	I-R	Hyd*	Gem	S-57	
Chandler.....SS	123	31x6 1/2	Yes	Own	6	6-3 1/2 x 5	29.40	L	C	4	PC	Sch	Bos	Bos	P-B&B	Own	F-Own	4.45	E-R	E-T	Mec*	Own	S-57		
Chevrolet.....Superior	103	30x3 1/2	No	Own	6	4-3 1/2 x 4	21.76	I	C	3	PS	Zen	Rem	Rem	K-Own	Own	M-Own	1/2 Own	3.77	E-R	I-R	None	Own	Q-28	
Chrysler.....Six	112 3/4	29x4 1/2	Yes	Own	43	6-3 x 4 3/4	21.60	L	A	7	FP	Str	Rem	Rem	D-Own	Own	M-Own	1/2 Own	4.60	E-F	E-T	Hyd	Jax	S-51 1/2	
Cleveland.....43	115	31x5 1/2	Yes*	Own	311	6-3 1/2 x 4 1/2	39.20	L	A	3	PC	Sch	Bos	Bos	P-B&B	Own	R-Sne	1/2 Own	4.90	E-R	E-T	Mec*	CAS	S-53	
Cole.....Master	127 1/4	33x5	Yes*	Nort	311	8-3 1/2 x 4 1/2	39.20	L	A	3	PC	Joh	Del	Del	D-Nor	Nor	M-Spi	F-Col	4.70	E-R	I-R	None	Gem	S-57	
Columbia.....	115	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	Dur	M-Spi	1/2 Tim	4.80	E-R	E-T	Hyd*	Gem	S-57	
Crawford.....6-70	138	33x4 1/2	No	Cont	6T	6-3 1/2 x 5 1/2	31.54	L	C	4	PC	Zen	Wes	Bos	D-B-L	B-L	M-Spi	1/2 Tim	5.00	E-R	I-R	None	Lav	S-57	
Cunningham.....V4	132	33x5	No	Own	V4	8-3 1/2 x 5	45.00	L	C	3	FP	Str	Del	Del	D-Own	Own	R-Sne	F-Tim	4.23	E-R	I-R	None	Own	J-62	
Dagmar.....6-70	138	33x5	No	Cont	6T	6-3 1/2 x 5 1/2	31.54	L	C	4	PC	Zen	Wes	Bos	D-B-L	B-L	M-Spi	1/2 Tim	5.00	E-R	I-R	None	Lav	S-57	
Daniels.....24-38	138	33x5	Yes*	Own	24-38	8-3 1/2 x 5 1/2	39.20	L	C	3	PC	Zen	Wes	Del	P-Own	B-Own	M-Spi	F-Tim	4.23	E-R	I-R	None	Own	S-57	
Davis.....71	115	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-R	I-R	Hyd*	Ros	S-52	
Davis.....81	118	32x4 1/2	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	A-L	A-L	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-R	I-R	Hyd*	Ros	S-52	
Dodge Brothers.....	116	32x4	Yes*	Own	4-3 1/2 x 4	24.03	L	A	3	PS	Ste	N-E	D-Own	Own	M-Own	Own	M-Own	1/2 Own	4.54	E-R	I-R	None	Own	S-55	
Dort.....27	115	31x4	Yes*	Fall	T8000	6-3 1/2 x 4 1/2	23.41	I	C	3	PC	Car	Bos	Bos	D-Dil	Own	M-The	3/4 Fli	4.66	E-R	I-R	None	Gem	V-50	
Duesenberg Straight.....	134	33x5	No	Own	8	8-2 1/2 x 5	26.45	I	A	3	PC	Str	Del	Del	P-Own	Own	R-Cl	1/2 Own	4.90	I-F	E-T	Hyd	Lav	S-59	
Dupont.....C	124	32x4 1/2	No	H-Sp	90	6-3 1/2 x 5	29.40	L	C	3	PS	Str	Wes	Wes	D-B-L	B-L	M-Spi	F-Col	4.45	E-R	I-R	None	Jac	S-58	
Durant.....A-22	109	31x4	Yes*	Cont	Spec	4-3 1/2 x 4 1/2	24.03	I	C	3	PC	Til	A-L	A-L	P-Own	War	M-Spi	3/4 Ad	4.33	E-R	I-R	Mec*	War	S-48	
Elcar.....6-41	112	31x4	No	Lyc	CF	4-3 1/2 x 5	21.03	L	A	5	PC	Zen	Del	Del	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	I-R	Mec*	Ros	S-51	
Elcar.....6-51	113	31x4	No	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	E-T	Mec*	Ros	S-51	
Elcar.....6-61	118	32x4	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	I-R	Mec*	Ros	S-52	
Elgin.....25	118	32x4 1/2	Yes*	Fall	T8000	6-3 1/2 x 4 1/2	23.44	I	C	3	PC	Str	DeJ	DeJ	P-B&B	War	R-Sne	1/2 Col	4.66	I-F	E-T	Mec	Ros	O-47	
Essex.....6	110 1/2	32x5 1/2	Yes*	Own	6	6-2 1/2 x 4	16.54	L	A	3	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	1/2 Own	5.60	E-R	I-R	None	Own	S-54 1/2	
Flint.....40	115	30x4 1/2	Yes	Cont	Spec	6-3 1/2 x 4 1/2	23.44	L	C	7	PC	Til	A-L	A-L	P-Own	War	M-Spi	1/2 Ad	4.77	E-F	E-F	Mec	War	S-54	
Flint.....55	120	32x4 1/2	Yes*	Cont	Spec	6-3 1/2 x 5	27.34	I	C	7	PC	Str	DeJ	DeJ	P-Own	War	M-Spi	1/2 Ad	4.77	E-R	I-R	Mec*	War	S-54	
Ford.....T	100	30x3 1/2	No	Own	T	4-3 1/2 x 4	22.50	L	C	3	Sp	(Own)	Own	Own	D-Own	Own	M-Own	1/2 Own	3.66	E-T	I-R	None	Own	O-43 1/2	
Franklin.....10-C	115	32x4 1/2	Yes*	Own	10-C	6-3 1/2 x 4	25.35	I	A	7	PC	Str	A-K	A-K	P-M&E	Own	M-Spi	F-Own	4.73	E-T	E-R	None	Own	E-38	
Gardner.....Series 5	112	32x4	Yes*	Lyc	Spec	4-3 1/2 x 5	21.76	L	A	5	PC	Zen	Wes	Wes	P-B&B	Mec	M-Pet	3/4 Fli	4.80	I-R	I-R	None	Ros	E-51	
Gray.....O	104	30x3 1/2	No	Own	R	4-3 1/2 x 4	21.03	L	C	3	Sp	Sco	Wes	Wes	P-Own	Det	R-Sne	1/2 Tim	3.90	I-R	I-R	None	Own	Q-30	
H.C.S.....Series 4	120	32x4 1/2	No	Weid	Spec	4-3 1/2 x 5 1/2	22.50	I	C	3	PS	Str	Del	Del	D-B-L	B-L	M-Spi	1/2 Own	4.63	I-R	I-R	None	Gem	S-56	
H.C.S.....Series 6	126	32x5	Yes*	Own	60	6-3 1/2 x 5	29.40	I	C	3	FP	Str	Del	Del	D-B-L	B-L	M-Spi	3/4 Own	4.63	I-R	I-R	None	Gem	S-56	
Hatfield.....6-55	121	32x4	No	H-Sp	40	6-3 1/2 x 5	25.35	L	C	3	PS	Str	Bos	Bos	P-B&B	Dur	M-Spi	1/2 Col	4.63	E-R	I-R	None	Gem	S-58	
Haynes.....60	121	32x4 1/2	Yes*	Own	60	6-3 1/2 x 4 3/4	29.40	L	C	3	PS	Ray	Kin	L-N	D-Own	Mec	M-Thi	1/2 Own	4.41	E-R	E-T	None	Jac	S-54 1/2	
Hudson.....Super 6	127	32x5 1/2	Yes*	Own	6	6-3 1/2 x 5	29.40	L	A	4	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	F-Tim	4.45	E-R	I-R	None	Gem	S-58	
Hupmobile.....Series R	115	32x4	Yes*	Own	R	4-3 1/2 x 5 1/2	16.90	L	A	3	PC	Str	A-K	A-K	D-Own	Own	M-Uni	3/4 Own	4.87	E-R	I-R	None	Ros	S-56 1/2	
Jewett.....Six	112	31x4	Yes*	Own	6	6-3 1/2 x 5	25.35	L	C	3	PC	Ray	A-K	Rem	D-Lon	War	M-Mec	1/2 Tim	4.45	E-R	E-T	None	Gem	S-54	
Jordan.....K	120	32																							

The Winner!



Joe Boyer in his
Duesenberg Special

CLASS OF SERVICE SYMBOL	
Telegram	Blk
Day Letter	Wht
Night Message	Blk
Night Letter	Blk

RECEIVED AT 2010 W. NORTH AVE.
AT 21C ES 58 4

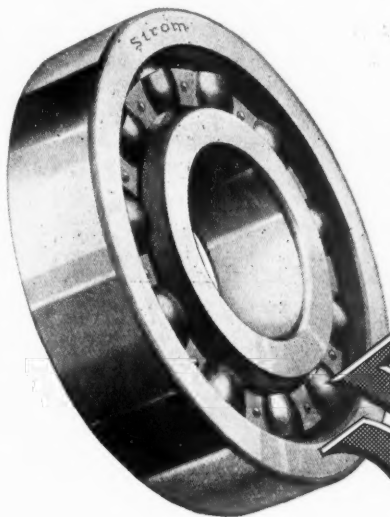
JUN 2 1924

THE STROM BALL BEARING OF 4555 PALMER AVE CHICAGO ILL
121
THE MOTOR IN THE WINNING DUESENBERG CAR IN THE NINETEEN
TWENTY FOUR SPEEDWAY RACE WAS EQUIPPED WITH STROM BEARINGS ALL
THE BEARINGS CAME THROUGH THIS HARD GRIND IN ABSOLUTELY PERFECT
CONDITION WE GREATLY APPRECIATE THE EXCELLENT SERVICE YOU RENDERED US

F S DUESENBERG
218P

JOE BOYER drove his Duesenberg Special to victory in the 1924 Speedway Race at Indianapolis. He averaged more than 98 miles an hour.

Another evidence of the sturdiness and reliability of Strom Ball Bearings.



Strom

BALL BEARINGS

STROM BALL BEARING MFG. CO.

Formerly U. S. Ball Bearing Mfg. Co.

4551 Palmer Street Chicago, Ill.

JOSEPH BOYER, JR.
DETROIT

June 3, 1924,

Mr. Fred S. Duesenberg,
Duesenberg Brothers,
Indianapolis, Indiana.

Dear Fred:

Since we have always had perfect satisfaction from Strom bearings I wish to request that they be used throughout the new race car which you are now building for me to be used in this year's events.

I trust this will meet with your entire satisfaction.

Yours very truly,

Joe Boyer

JB/C

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL	Wheelbase (Ins.)	TIRES		ENGINE										Electrical System		Clutch	Gear-set	Uni-versal Joints	REAR AXLE		BRAKES			Steering Gear	Rear Springs
		Standard Size (Ins.)	Balloon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Name	Make	Type and Make	Type and Make	Gear Ratio	Foot, Type and Location	Hand, Type and Location	Four Wheel Brake Type	Make	Type and Length	
Paige.....	131	33x4 1/2	Yes*	Cont	Spec	6-3 1/2 x 5 1/2	33.75	L C	4	PC	Ray	A-K	Rem	D-Lon	W-G	M-Mec	1 1/2 Tim	4.90	E-R	I-R	None	Gem	S-61 1/2		
Peerless.....	70	33x6 1/2	Yes*	Own	70	6-3 1/2 x 5 1/2	29.40	L C	7	PC	Joh	Del	Del	D-Own	Own	M-Spi	1 1/2 Tim	4.66	E-F	I-R	Hyd	Gem	S-54 1/2		
Peerless.....	66	33x5 1/2	Yes*	Own	66	8-3 1/2 x 5 1/2	33.80	L C	3	PC	Bal	Del	Del	D-Own	Own	M-Spi	3/4 Tim	4.90	E-R	I-R	Hyd*	Gem	S-60		
Pierce-Arrow.....	33	33x5 1/2	No	Own	33	6-4 x 5 1/2	38.40	T C	7	FP	Own	Del	Del	D-Own	Own	M-Spi	1 1/2 Tim	4.29	E-R	I-R	Mec*	Own	S-57 1/2		
Premier.....	6-D	32x4 1/2	Yes*	Own	6-D	6-3 1/2 x 5 1/2	27.34	I A	3	PC	Str	Del	Del	D-B&B	Own	M-Blo	1 1/2 Col	4.58	E-R	I-R	Hyd*	Own	S-57 1/2		
R & V Knight.....	11	32x4 1/2	No	Own	Kni	6-3 1/2 x 4 1/2	29.40	X C	4	PC	Str	A-L	A-L	P-B-L	B-L	M-Spi	1 1/2 Tim	5.40	E-R	I-R	None	Jac	S-61		
Reo.....	T6	32x4 1/2	Yes*	Own	T6	6-3 1/2 x 5 1/2	24.34	G A	4	PS	Str	NE	NE	D-Own	Own	M-Spi	1 1/2 Tim	4.70	E-R	I-R	None	Own	S-54 1/2		
Revere.....	131	32x4 1/2	Yes*	Mons	C	4-4 1/2 x 6	30.63	II A	2	PS	Str	Bos	Wes	D-B-L	B-L	M-Spi	3/4 Stn	3.44	E-R	I-R	None	Gem	S-58		
Rickenbacker.....	117	32x4 1/2	Yes*	Own	C	6-3 1/2 x 4 1/2	23.44	I C	3	PC	Str	Bos	Bos	P-Own	Own	M-Mec	3/4 Tim	5.10	I-F	E-T	Mec	Gem	S-57		
Rickenbacker.....	Vrt "8"	33x4 1/2	Yes*	Own	Vrt 8	8-3 x 4 1/2	28.80	L C	9	PS	Zen	Bos	Bos	M-Own	Own	M-Mec	3/4 Tim	4.60	I-F	E-T	Mec	Gem	S-59		
Roamer.....	6-34-1	32x4 1/2	No	Cont	12X1	6-3 1/2 x 5 1/2	29.40	L A	3	PS	Str	Spl	Wes	P-B&B	Own	R-M&E	3/4 Tim	4.60	.....	.....	Mec	Jac	V-55 1/2
Roamer.....	4-75-1	32x4 1/2	No	Dues	G1	4-4 1/2 x 6	28.90	II A	3	FP	Str	Bos	Wes	D-B-L	B-L	R-M&E	3/4 Tim	4.63	E-R	I-R	Mec*	Jac	V-55 1/2		
Rollin.....	G	21x5 1/4	Yes	Own	G	4-3 1/2 x 4 1/2	16.90	L A	4	PC	Til	Con	Dyn	P-B&B	Mun	R-Sne	1 1/2 Sal	5.10	E-F	I-F	Mec	Dit	S-46 1/2		
Rolls-Royce.....	40-5	33x5 1/2	No	Own	40	6-4 1/2 x 4 1/2	48.60	L A	7	FP	Own	Bos	O" K-Own	K-Own	Own	M-Own	F Own	3.72	I-R	I-R	None	Own	V-54 1/2		
Seneca.....	50&51	31x4	No	Lycor	CF	4-3 1/2 x 5 1/2	21.03	L A	5	PC	Zen	A-L	A-L	P-B&B	Own	M-Uni	F Pen	4.50	E-R	I-R	None	Dit	S-52		
Stanley.....	750	32x4 1/2	No	Own	750	2-4 x 5	13.00	L C	3	PS	Non	Non	Bij	Non	Non	Non	1 1/2 Ad	4.50	E-R	I-R	None	Own	S-49		
Star.....	4	30x3 1/2	No	Cont	Spec	4-3 1/2 x 4 1/2	15.63	L C	3	PS	Til	A-L	A-L	P-Own	War	M-Spi	3/4 Ad	4.87	E-R	I-R	Mec*	War	S-49		
Stearns-Knight.....	SKL4	33x4 1/2	No	Own	Kni	4-3 1/2 x 5 1/2	22.50	X C	4	PC	Sch	A-K	A-L	D-Own	Own	R-Cl	1 1/2 Tim	4.50	E-R	I-R	Hyd*	Own	V-50		
Stearns-Knight.....	6	33x5 1/2	No	Own	Kni	6-3 1/2 x 5 1/2	25.35	X C	4	PC	Sch	A-K	A-L	D-Own	Own	R-Cl	1 1/2 Tim	4.70	E-R	I-R	Hyd*	Own	V-50		
Stephens.....	104&2	32x4 1/2	No	Own	20	6-3 1/2 x 4 1/2	25.35	I C	3	FP	Str	Del	Del	P-B&B	Mec	M-Mec	1 1/2 Tim	5.10	E-R	E-T	None	Gem	S-56 1/2		
Sterling-Knight.....	124	33x4 1/2	No	Own	Kni	6-3 1/2 x 4 1/2	25.35	X C	7	FP	Str	Wes	Wes	D-Ful	Ful	R-Cl	1 1/2 Tim	4.56	E-R	I-R	None	Ros	S-58		
Stevens Duryea.....	G	33x5 1/2	No	Own	G	6-4 1/2 x 5 1/2	47.25	L C	4	PC	Str	Bos	Bos	D-Own	B-L	M-Spi	F Tim	3.76	E-R	I-R	None	Ros	S-57 1/2		
Studebaker.....	Light Six	31x4	No	Own	EM	6-3 1/2 x 4 1/2	23.44	L C	4	PS	Str	Wag	Wag	P-Own	Own	R-The	1 1/2 Tim	5.00	E-R	I-R	None	Own	S-50		
Studebaker.....	Spec. Si	32x4	No	Own	EL	6-3 1/2 x 5 1/2	29.40	L C	4	PS	Str	Wag	Wag	P-Own	Own	M-Spi	1 1/2 Tim	4.33	E-R	I-R	None	Own	S-56		
Studebaker.....	Big Six	33x4 1/2	No	Own	EK	6-3 1/2 x 5 1/2	36.04	L C	4	PS	Bal	Wag	Wag	P-Own	Own	M-Spi	1 1/2 Tim	3.71	E-R	I-R	None	Own	S-56		
Stutz.....	69	32x4 1/2	No	Own	6-90	6-3 1/2 x 5 1/2	27.34	I B	3	FP	Str	Rem	Rem	P-B&B	W-G	M-Mec	1 1/2 Tim	4.66	E-R	I-R	None	Gem	S-52		
Stutz.....	KLDH	32x4 1/2	No	Own	KLDH	4-4 1/2 x 6	30.63	T C	3	PC	Str	Del	Rem	D-W-G	Own	M-Har	3/4 Tim	3.75	I-R	I-R	None	Gem	S-60		
Stutz.....	695	32x4 1/2	Yes*	Own	695	6-3 1/2 x 5 1/2	29.40	I C	3	PC	Str	Rem	Rem	P-B&B	W-G	M-Uni	1 1/2 Tim	4.66	E-R	I-R	Hyd*	Own	S-61 1/2		
Templar.....	122	33x4	No	Own	6-3 1/2 x 5 1/2	27.34	L C	PS	T1	Dyn	Dyn	P-M&E	War	R-Sne	3/4 Sal	5.10	I-F	E-T	Mec	Ros	S-54				
Velie.....	56&58	32x4 1/2	Yes*	Own	56	6-3 1/2 x 4 1/2	24.38	I C	4	FP	Str	Wes	Wes	P-B&B	Dur	M-Thi	1 1/2 Tim	5.10	E-R	I-R	Hyd*	Ros	S-55		
Westcott.....	48	32x4 1/2	Yes*	Cont	12X	6-3 1/2 x 5 1/2	29.40	L A	3	PS	Ray	Del	Del	P-B&B	B-L	M-Pet	1 1/2 Tim	4.45	E-R	I-R	Mec*	Gem	S-59		
Westcott.....	44	32x4 1/2	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L C	4	PC	Ray	De	De	P-B&B	War	M-Pet	1 1/2 Col	4.90	E-R	E-T	Mec*	Gem	S-57 1/2		
Westcott.....	60	32x4 1/2	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L C	4	PC	Ray	De	De	P-M&E	War	M-Pet	1 1/2 Col	4.66	E-R	E-T	Mec*	Gem	S-57 1/2		
Wills Ste. Claire.....	A&B&C	32x4 1/2	Yes	Own	68	8-3 1/2 x 4	33.80	I C	3	FP	Sch	De	De	P-Own	Own	M-Spi	1 1/2 Eat	4.45	E-F	I-R	Mec	Own	S-54 1/2		
Willys Knight.....	64&67	32x4 1/2	No	Own	64	4-3 1/2 x 4 1/2	21.03	X C	3	PS	Til	A-L	A-L	D-Own	Own	R-Own	3/4 Tim	4.44	E-R	I-R	None	Own	S-55		
Willys Knight.....	124	32x4 1/2	No	Own	64	4-3 1/2 x 4 1/2	21.03	X C	3	PS	Til	A-L	A-L	D-Own	Own	R-Own	3/4 Tim	5.12	E-R	I-R	None	Own	S-55		
TAXICABS																									
Checker.....	117	32x4 1/2	No	Buda	WTU	4-3 1/2 x 5 1/2	22.50	L C	3	PC	Zen	Bos	Wes	D-Ful	Ful	Blo	3/4 Col	4.87	E-R	I-R	None	Jon	S-57 1/2		
Dodge.....	116	32x4	Yes*	Own	Own	4-3 1/2 x 4 1/2	24.03	L A	3	SP	Ste	N-E	N-E	D-Own	Own	M-Own	1 1/2 Tim	4.54	E-R	I-R	None	Own	S-55		
Driggs.....	108 1/2	30x3 1/2	No	Own	Own	4-2 1/2 x 4 1/2	11.03	L C	3	PS	Car	Bos	Bos	D-Ful	Own	M-Spi	3/4 Tim	4.75	E-R	I-R	None	Own	S-55		
Elcar.....	4	33x4 1/2	No	Lycor	CF	4-3 1/2 x 5 1/2	21.03	L A	5	PC	Car	Del	Del	P-B&B	Mun	Pet	3/4 Sal	4.75	E-R	I-R	None	CAS	S-51		
Elcar.....	6	33x4 1/2	No	Cont	8R	6-3 1/2 x 4 1/2	27.34	L C	4	PC	Str	Del	Del	P-B&B	War	Spi	3/4 Sal	4.75	E-R	I-R	None	Gem	S-52		
Kelsey.....	E	32x4	No	Lycor	CH	4-3 1/2 x 5 1/2	19.60	L A	5	PC	Zen	Bos	Bos	P-B&B	W-M	M-Spi	3/4 Sal	5.10	E-R	I-R	None	Lav	S-55		
Pennant.....	115	33x4 1/2	No	Buda	WTU	4-3 1/2 x 5 1/2	22.50	L B	3	PC	Zen	Bos	Wes	D-Ful	Ful	Blo	3/4 Col	4.87	E-R	I-R	None	Jon	S-57		
Premier.....	4A	33x4 1/2	No	Buda	WTU	4-3 1/2 x 5 1/2	22.50	L B	3	PC	Zen	Bos	Bos	D-Ful	Ful	Blo	3/4 Col	4.70	E-R	I-R	None	Own	S-57 1/2		
Rauch & Lang.....	T	32x4	No	Buda	WTU	4-3 1/2 x 5 1/2	22.50	L B	3	PC	Zen	Bos	Dyn	P-Det	Det	Spi	1 1/2 Sta	5.10	E-R	E-T	None	Gem	S-59 1/2		
Rauch & Lang**.....	102	32x4 1/2	No	Own	Own	Electric	24.30	G A	PS	Ray	N-E	N-E	N-E	D-Own	None	Own	Own	8.60	.....	.....	None	Gem	S-55
Reo.....	V	33x4 1/2	Yes*	Own	Own	6-3 1/2 x 5 1/2	24.30	G A	PS	Ray	N-E	N-E	N-E	D-Own	None	Own	Own	4.70	E-R	I-R	None	Own	S-55		
Traveler.....	108 1/2	32x4	No	Buda	WTU	4-3 1/2 x 5 1/2	22.50	L B	3	PC	Eis	Eis	B-L	W-M	Spi	Col	E-R	I-R	None	Gem	S-55	
White.....	15A	34x4 1/2	No	Own	Own	4-3 1/2 x 5 1/2	22.50	L C	3	Sp	Zen	N-E	N-E	P-Own	Own	Own	1 1/2 Tim	4.90	E-R	I-R	None	Own	S-55		
Willys Knight.....	A	32x4 1/2	No	Own	Own	4-3 1/2 x 4 1/2	21.03	X C	3	PS	Til	A-L	A-L	D-Own	Own	Own	3/4 Tim	5.12	E-R	I-R	None	Own	S-55		
Yellow.....	A-2	32x4 1/2	No	Cont	V7	4-3 1/2 x 5 1/2	18.23	L C	3	PC	Zen	Bos	N-E	D-B-L	B-L	Spi	1 1/2 Tim	4.90	E-R	E-T	None	Gem	S-55		
Yellow.....	O-7	29x4 1/2	Yes	Cont	V7	4-3 1/2 x 5 1/2	18.23	L C	3	PC	Zen	Bos	N-E	D-B-L	B-L	Spi	1 1/2 Tim	4.20	E-R	E-T	None	Gem	S-55		

TAXICABS

Checker.....	117	32x4½	No	Buda	WTU	4-3¾x5½	22.50	L	C	3	PC	Zen	Bos	Wes	D-Ful	Ful	Blo	¾-Col	4.87	E-R	I-R	None	Jon	S-57½
Dodge.....	116	32x4	Yes*	Own		4-37⁄8x4½	24.03	L	A	3	SP	Ste	N-E	N-E	D-Own	Own	M-Own	½ Own	4.54	E-R	I-R	None	Own	S-55
Driggs.....	108½	30x3½	No	Own		4-2½x4½	11.03	L	C		PS	Zen	Bos	Bos	D-Ful	Own	Spi	¾ Own	4.75	E-R	I-R	None	Own	S-
Elcar.....	4	33x4½	No	Lycor	CF	4-3⁄8x5	21.03	L	A	5	PC	Car	Del	Del	P-B&B	Mun	Pet	¾ Sal	4.75	E-R	I-R	None	CAS	S-51
Elcar.....	6	33x4½	No	Cont	8R	6-3⁄8x4½	27.34	L	A	4	PC	Str	Del	Del	P-B&B	War	Spi	¾ Sal	4.75	E-R	I-R	None	Gem	S-52
Kelsey.....	E	32x4	No	Lycor	CH	4-3½x5	19.60	L	A	5	PC	Zen	Bos	Bos	P-B&B	W-M	M-Spi	¾ Sal	5.10	E-R	I-R	None	Lav	S-55
Pennant.....	115	33x4½	No	Buda	WTU	4-3¾x5½	22.50	L	B	3	PC	Zen	Bos	Wes	D-Ful	Ful	Blo	¾ Col	4.87	E-R	I-R	None	Jon	S-57
Premier.....	4A	33x4½	No	Buda	WTU	4-3¾x5½	22.50	L	B	3	PC	Zen	Bos	Bos	D-Ful	Ful	Blo	¾ Col	4.70	E-R	I-R	None	Own	S-57½
Rauch & Lang.....	T	32x4	No	Buda	WTU	4-3¾x5½	22.50	L	B	3	PC	Zen	Bos	Dyn†	P-Det	Det	Spi	½ Sta	5.10	E-R	E-T	None	Gem	S-59½
Rauch & Lang**.....	102	33x4½	No	Own		Electric									None	None	Own	Own	8.60			None	None	S-
Reo.....	V	33x4½	Yes*	Own		6-3½x5	24.30	G	A		PS	Ray	N-E	N-E	D-Own	Own	Own	¾ Own	4.70	E-R	I-R	None	Own	S-55
Traveler.....	108½	32x4	No	Buda	WTU	4-3¾x5½	22.50	L	B	3	PC	.....	Eis	Eis	B-L	W-M	Spi	Col	.....	E-R	I-R	None	Gem	S-
White.....	15A	34x4½	No	Own		4-3¾x5½	22.50	L	C		Sp	Zen	N-E		P-Own	Own	Own	½ Own		E-R	I-R	None	Own	S-
Willys Knight.....	A	32x4½	No	Own		4-3⁄8x4½	21.03	X	C	3	PS	Fil	A-L	A-L	D-Own	Own	Own	¾ Own	5.12	E-R	I-R	None	.....	.....
Yellow.....	O-2	32x4½	No	Cont	V7	4-3¹⁄⁸x5	18.23	L	C	3	PC	Zen	Bos	N-E†	D-B-L	B-L	Spi	½ Tim	4.90	E-R	E-T	None	Gem	.....
Yellow.....	A-2	29x4½	Yes	Cont	V7	4-3⁄8x5	18.23	L	C	3	PC	Zen	Bos	N-E†	D-B-L	B-L	Spi	½ Tim	4.20	E-R	E-T	None	Gem	56

ABBREVIATIONS—

†—Electric
 ‡—Generator only
 *—At extra cost
 †—On Phaeton models
 A—Aluminum
 Anst—Ansted
 Ad—Adams
 A-K—Atwater-Kent
 A-L—Auto-Lite
 B—Bentley
 B&B—Borg & Beck
 B-F—Both Internal and External Four Wheels
 Bij—Bijur
 B-L—Brown-Lipe
 Blo—Blood
 Bos—Bosch
 C—Cast Iron
 Car—Carter
 Cl—Chimax
 Col—Columbia
 Con—Connecticut
 Cont—Continental

D—Multiple Disk
 Del—Delco
 Det—Detroit
 De J—De Jon
 Dit—Ditwiler
 Doo—Dooley
 Dtl—Detlaff
 Dues—Duesenberg
 Dur—Durstun
 Dyn—Dyneto
 E—Full Elliptic
 E-F—External Four Wheels
 E-R—External Rear Wheels
 E-T—External Transmission
 Ent—Eaton
 F—Full Floating
 F-L—Falls
 Fil—Flint
 FP—Full Pressure to all bearings including wrist pins
 Ful—Fuller
 1/2 F—Semi-Floating
 3/4 F—Three-Quarter Floating
 G—Head and Side
 G-D—Gray & Davis
 Gem—Gemmer

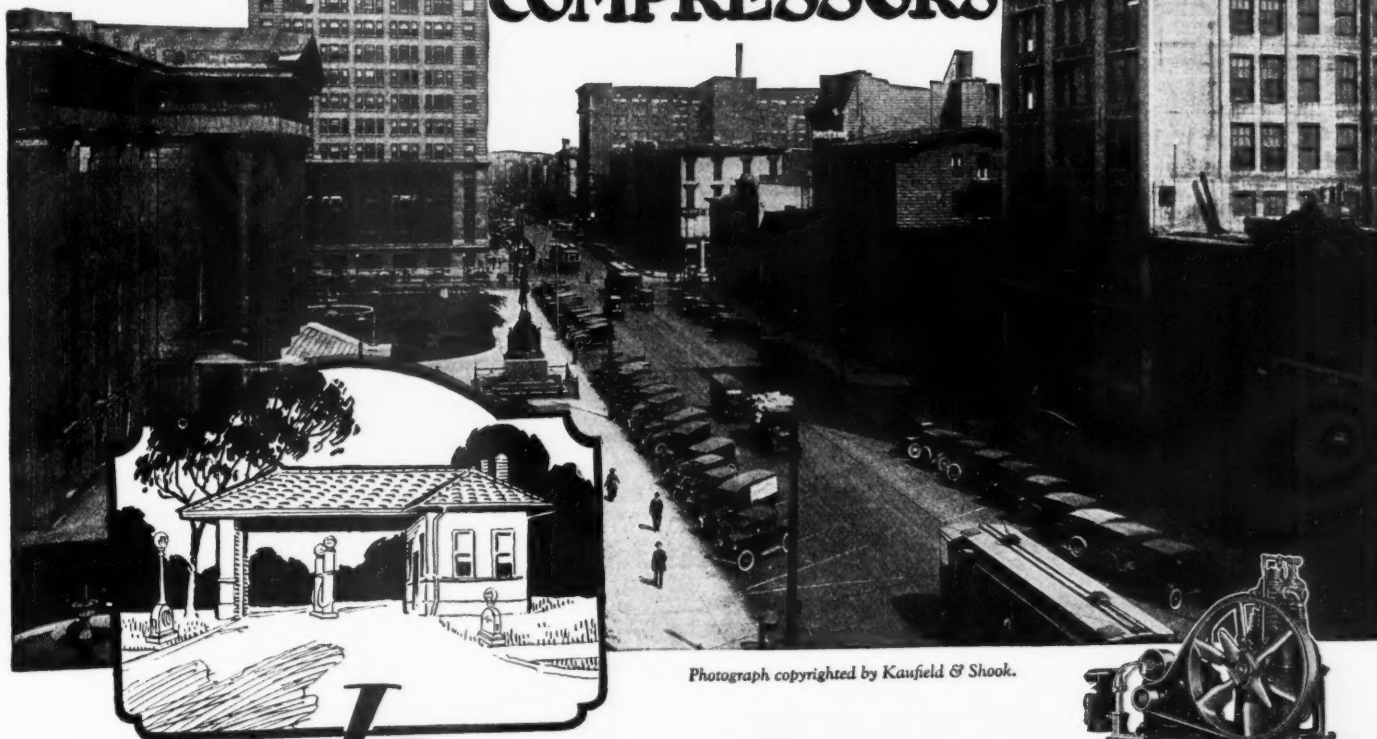
G-L—Grant-Less
 Goo—Goodrich
 H—Horizontal
 Har—Hart
 Hol—Holley
 Hoo—Hoosier
 H-Sp—Herschell-Spiller
 Hyd—Hydraulic
 I—In Head
 I-F—Internal Four Wheels
 I-R—Internal Rear Wheels
 J—Three-Quarter Elliptic
 Jac—Jacox
 Jax—Jaxon
 Joh—Johnson
 Jon—Jones
 K—Cone
 Kin—Kingston
 L—L Head
 Lav—Lavine
 Lon—Long
 L-N—Leece-Neville
 Lyeo—Lycorning
 Mar—Marvel
 M—Metal

M&E—Merchant & Evans
 Mec—Mechanics
 Mons—Monson
 Mun—Muncie
 N—Platform
 Non—None
 N.E.—North East
 Nor—Northway
 O—Special Type
 P—Single Plate
 PC—Pressure to all Crankshaft and connecting rod bearings
 Pen—Penfield
 Pet—Peters
 Pic—Pick
 PS—Splash with Pressure
 Q—Quarter Elliptic
 R—Fabric
 Ray—Rayfield
 Rem—Remy
 Roc—Rockford
 Ros—Rosa
 S—Semi Elliptic
 Sal—Salsbury
 Sch—Schebler

Sco—Scoe
 Sne—Snead
 Sp—Circulating Splash
 Spe—Special
 Spi—Spicer
 Spl—Splittorf
 S.E.—Standard Equipment
 Sta—Standard
 Ste—Stewart
 Str—Stromberg
 T—T Head
 The—Thermoid
 Thi—Thiener
 Til—Tillotson
 Tim—Timken
 Uni—Universal
 V—Cantilever
 W-G—Warner Gear
 W-M—Willis-Morrow
 Wag—Wagner
 War—Warner
 Weid—Weidely
 Wes—Westinghouse
 Wis—Wisconsin
 Y—Yeeve
 Zen—Zenith

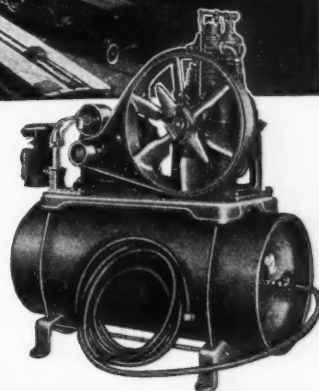
CURTIS AIR COMPRESSORS

LOUISVILLE, Ky.—Popu-
lation 257,671. Trade
population 350,000.
Jefferson Street, east,
from City Hall Tower.



Photograph copyrighted by Kaufeld & Shook.

In Kentucky ~



No Spitting of Oil When A Curtis Cuts Out

There are two sound reasons for this. First: the exclusive and patented controlled splash oiling system prevents an excess of oil from getting into the discharge line. Second: there is no bleeding discharge pipe or intermediate tank. Automatic starting and stopping device includes a centrifugal unloader, to relieve compressor of starting load.

The new Curtis
Air and Water
Stand made
column or low
type.



CURTIS
PNEUMATIC
MACHINERY CO.
1527 Kienlen Ave.
ST. LOUIS, MO.

Gentlemen:—Please send me
full details on ☐ Curtis Air Com-
pressors ☐ Curtis Air Stands, your propo-
sition and prices.

Name

Address

Jobber's Name

Address

KENTUCKY, with its ever growing popu-
lation of over 2,500,000, with approx-
imately 155,000 automobiles and over
2185 auto garages and accessory dealers, is a
true reflection of the superiority of Curtis Air
Compressors. Here you will find Curtis the
popular choice—simply a tribute to a worthy
product by a state long noted for its discrimi-
nating judgment of inherent quality.

Curtis Compressors are the product of an insti-
tution with a successful record of 70 years' man-
ufacturing experience, 27 of which have been

devoted to the design and manufacture of air
compressors and compressed air equipment.

This means that every purchaser of a Curtis Out-
fit can have complete faith in it—it means that
when purchasing a Curtis you are getting a tried
and proven compressor, one with an enviable
record and a definite reputation to live up to;
an assurance that a Curtis Air Compressor is
not likely to ever become an "orphan."

A complete line of single and two-stage air com-
pressors, a style, size and arrangement to meet
your particular need. Also air and water stands.
Use coupon for full information.

CURTIS PNEUMATIC MACHINERY CO.
1527 Kienlen Ave. St. Louis, U. S. A.
Branch Office 530-H Hudson Terminal, New York City

CURTIS

1854 ^{70th} ANNIVERSARY 1924



More Chain Miles— More Chain Sales

Sell a man a set of McKay Tire Chains and you've forever ended his "shopping-around" days for tire chains. Whenever that man or any of his fellow-motorists needs another set of chains, you'll have "first call" on the sale. Once a man knows from experience the remarkably long life and durability and convenience of McKays, he won't have anything else.

McKay Tire Chains outlast ordinary chains by months and

miles—because they are hardened *hard* to stand long wear, and toughened to stand shocks and jars. You can bang and pound and grind McKays all you want to—they'll stand up under use that would shatter and break ordinary chains.

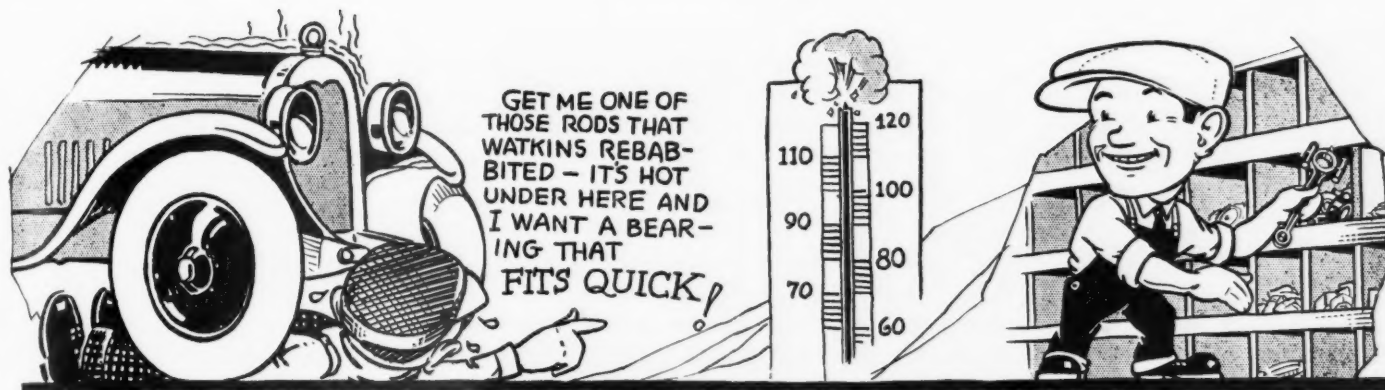
Every time you sell a set of McKay Tire Chains you've produced an advertisement for your business. More miles from McKays means more sales for you.

UNITED STATES CHAIN & FORGING COMPANY, Pittsburgh, Pa.
Makers of McKay Tire Chains, McKay Shurout Chains,
McKay Ready Repair Links.

Pacific Coast Sales Representatives
NORMAN COWAN COMPANY, 451 Rialto Bldg., San Francisco, Cal.

McKAY TIRE CHAINS

McK



Watkins Rebabbiting Service Makes Your Work Easier

**Just
how**

The next time you are on your back under a car, fitting a bearing while the mercury runs out of the top of the thermometer—perspiration popping out all over—then's the time to make up your mind to send your next connecting rods to a Watkins Rebabbiting Service plant for bearings which fit quick to the crankshaft.

Mechanics who have fit Watkins rebabbitted bearings don't fight shy of bearing work—they take it with a smile.

Garages and dealer service stations don't have to shave the bill as they sometimes did when it took more time to fit connecting rod bearings than they could make the customer believe.

Those who have trouble with bronze back bearings working loose and beating out, can eliminate it by having the bearing poured solid in the rod and tinned in.

General machine and repair shops can make more money on rebabbiting by sending their parts to the Watkins specialist, with specialized equipment, than doing it themselves or making an investment too large for the limited amount of local work they can procure.

WATKINS *Complete* **REBABBITTING SERVICE**

Watkins Rebabbiting Service means complete rod rebuilding. New bearings tinned in and broached to mirror finish. New nuts, bolts, Laminated Shims, are furnished, also piston pin bushings if used.

May be you are not familiar with the variety of bearing service which a Watkins Plant can give you, or do you know the profit possibilities in having your connecting rods rebabbitted instead of throwing them away. If you have some rods on hand now send them in to be rebabbitted and rebuilt. If not, address a letter to the nearest Watkins Plant asking how you can use rebabbitting service in your particular line of business. The place that makes the money this year is hunting profit opportunities and saving possibilities.

Send Parts to Factory Nearest You for Quickest Service

Chicago, Ill., 57-61 E. 24th St. Berguson Skinner Corporation
Hartford, Conn., 28 High St. Ripley Motor Services, Inc.
Indianapolis, Ind., 19-29 W. South St. Indiana Watkins Mfg. Co.
Kingston, Ont. Watkins Mfg. Co., of Canada, Ltd.
Los Angeles, Calif., 1007 E. Ninth St. Wright Mfg. Co.
Memphis, Tenn., 278 Washington Ave. J. B. Cook Auto Machine Co.
Minneapolis, Minn., 13 Second St. S. E. Wright Manufacturing Co.
New York, N. Y., 27-37 W. 60th St. Lake Sales Company
Omaha, Nebr., 1006-10 Douglas St. Interstate Machinery & Supply Co.

Portland, Ore. Factory Motor Car Co.
St. Louis, Mo., 4216 Easton Ave. H. & H. Machine Co.
Seattle, Wash. Solon Grinding Co.
Syracuse, N. Y., 201-211 Wyoming St. Watkins Mfg. Co. of New York
Toledo, Ohio, 1942 Putnam St. Stewart Borgan Co.
Washington, D. C., 1628 L St., N. W. R-L Motive Parts, Inc.
Waterloo, Ia. All States Rebabbiting Service
Wichita, Kans., Home Office. Watkins Manufacturing Company

The Watkins Mfg. Co. Home Office Wichita, Kans.

Authorized Exclusively by Buick Motor Co., to Rebabbit and Rebuild Buick Rods.

New Prices

WATSON STABILATORS

former price

\$64.⁰⁰

now



FORDS

\$25.⁰⁰

former price \$32.⁰⁰

Sensational price revision— result of increased volume

Packard, Franklin, Marmon, Duesenberg—on the subject of easy riding, there stands no higher authority than any one of these builders. Collectively, their unanimous verdict in favor of Watson Stabilators is paramount guidance for any man wanting the utmost riding quality.

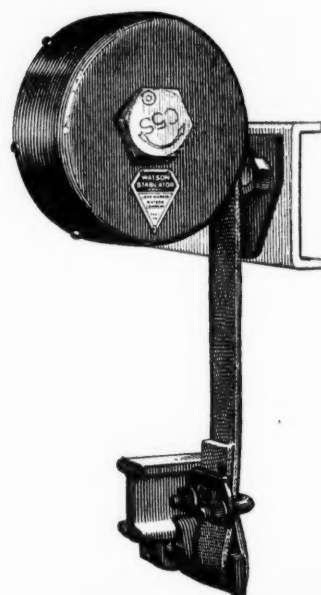
At former prices, Stabilators were an outstanding value. At the new prices, the value is sensational. No motorist need longer put up with old-fashioned, jack-in-the-box motoring. All men can now have this last word in motoring ease and luxury—and safety.

Begin today to enjoy Stabilated motoring. See your Car Dealer or Garage Man.

In no detail or particular has the quality, design or construction of Stabilators been altered.

Economies now made possible by vast production are passed on in whole to the consumer.

Stabilation is the acknowledged last word in Easy Riding.



JOHN WARREN WATSON COMPANY, Twenty-fourth and Locust Streets, PHILADELPHIA



QUIET operation has always been one of the outstanding features of Hyatt Quiet Roller Bearings. And now, in the Hyatt New Series Bearings, this distinctive and highly desirable feature is even more pronounced.

The quiet performance of motors, axles and transmissions equipped with Hyatt New Series Roller Bearings, contributes very materially to the lasting quiet performance of the cars in which they are used.

Manufacturers are better able to meet the requirements of consistent quiet operation through the use of Hyatt Quiet New Series Roller Bearings for supporting shafts and gears.

HYATT ROLLER BEARING COMPANY

NEWARK DETROIT CHICAGO SAN FRANCISCO
HUNTINGTON, PHILADELPHIA, PITTSBURGH, MINNEAPOLIS
WORCESTER, BUFFALO, CLEVELAND, MILWAUKEE

*The
New Series*

HYATT
Quiet
Roller Bearings



Every Maxwell Owner
Wants a
United Air Cleaner

*You Can Make These
Easy Sales*

EVERY Maxwell car needs the protection of a United Air Cleaner against the dust, sand, grit and dirt that is sucked under the hood and into the motor. This foreign material combines with the oil, scores cylinder walls and wears piston rings and bearings and forms 85% of the carbon that lays the car up for repairs so frequently.

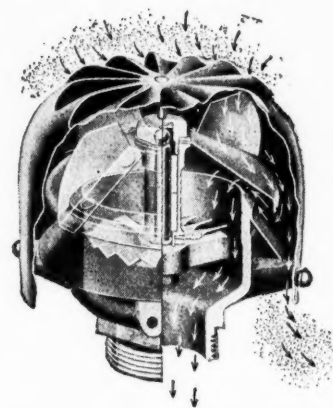
United Air Cleaners will protect Maxwell owners against this motor trouble. You can easily sell them to owners of any car for an air cleaner will save oil, make the motor run smoother and eliminate carbon deposits. United Air Cleaners can be attached in ten minutes and after installation require no attention whatsoever. They are absolutely automatic in operation and will outlast the car, with no adjustment, oiling or worry.

Fill out and send the coupon for our attractive dealer proposition. You will not be obligated in the least and you will learn of a money making opportunity that is worth while having.

United Manufacturing & Distributing Co.
9705 Cottage Grove Avenue, Chicago, Illinois

Wm. E. Kemp, 245 W. 55th St., New York City
New York and New England Distributor

The **UNITED
AIR CLEANER**
"Dustless Air to the Motor"



United Air Cleaners can be installed in 10 minutes on any make of car, truck or gasoline engine. Ford size sells at retail for \$5.00—other cars slightly higher. There is a generous profit to the dealer and installation is simple.

United Manufacturing & Distributing Co.
9705 Cottage Grove Ave., Chicago, Ill.

Gentlemen: Please send me your dealer proposition and full particulars about the United Air Cleaner.

Name.....

Address.....

M. A. 7-10-24

The "EYES" HAVE IT!



Is this your window ?

SOMETHING in this window that many pairs of eyes want to see. The eyes turn salesmen and make their owners want to buy.

That's why your window space is so valuable to you. It is constantly beckoning to passers to "Come buy."

The more attractive your window display, the more eyes you will set to work selling goods for you.

Johns-Manville has made a careful study of subjects and colors that attract eyes to windows—and sell merchandise.

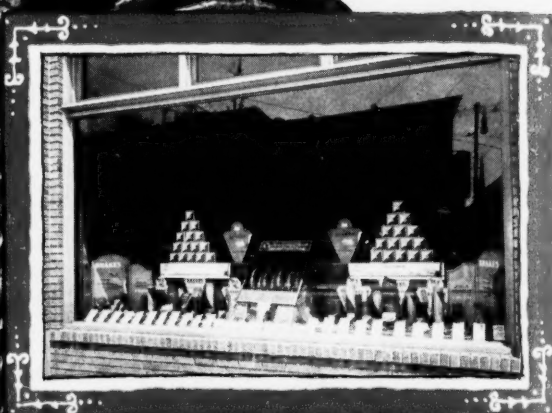
We will be very glad to furnish you with some of this display material. Ask your distributor about it. His name is listed three pages over.

A suggestion—

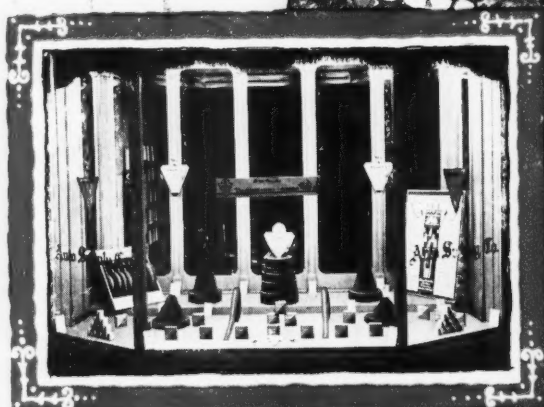
You may have windows in your shop without any display shelves. But these windows can still be turned into salesmen. The Johns-Manville window stickers, described on the next page, will do this.



Window of the
Herring Motor Co.
Des Moines, Iowa



Window of
Gaul, Derr &
Shearer Co.
Phila., Pa.



Auto Supply Co.
Baltimore, Md.
Window
Display



Window display
in the Des Moines
Register Bldg.
Des Moines, Iowa



Window of the Storz-
Western Auto Supply Co.
Omaha, Nebraska

The workmanship of Johns-Manville

BRAKE LINING is a standard material. You wouldn't think there could be very marked differences between brake linings—but there are.

It is skill and care in the detail of manufacture that make one brake lining more dependable than another.

First, take the question of asbestos fibre. Johns-Manville carefully selects the best of all the raw asbestos fibre for Johns-Manville Brake Lining. We are able to do this because we own and operate our own mines.

But the detail of manufacture is just as important. Examine a piece of Johns-Manville Lining. Notice how its thickness is maintained evenly right out to the edge. This insures maximum gripping power from edge to edge throughout its long life.

The impregnation is important too. Johns-Manville Brake Lining is impregnated with compound, not too much, not too little, but just enough to increase its natural resistance to oil and water without hampering brakeage.

It is workmanship of this character that gives Johns-Manville Brake Lining, as well as all other Johns-Manville automotive equipment, its high reputation in the automotive field.

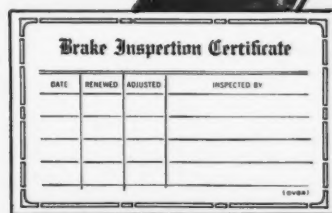
JOHNS - MANVILLE

Automotive Equipment,



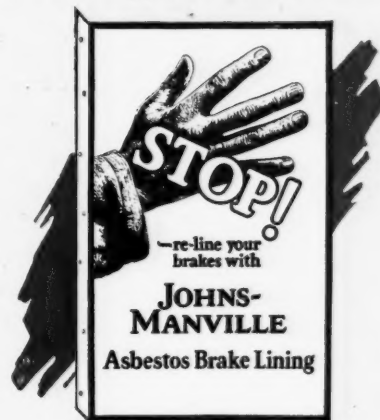
*Colorful
Window Posters*

These posters are loaded with color, novelty and attention. Just the right size too, 12" x 18". They are bound to draw eyes to your windows and then the feet below them into your shop. Phone your distributor.



Brakes inspected! The proof

Here's an idea of tremendous value to you. Every Brake Inspection Certificate you sign should mean a profit in your pocket. You can control the brake lining business in your locality with these cards. Get a supply from your distributor.



A salesman outside your door

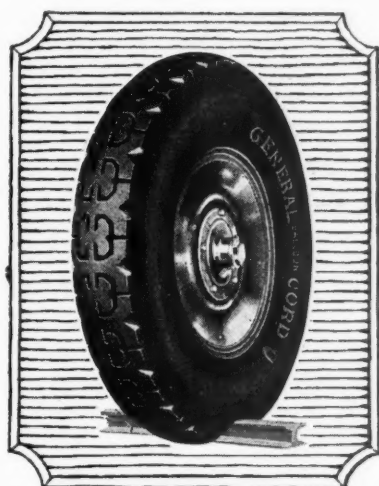
This bright flange sign gets motorists both coming and going, because its arresting message is printed on both sides of the sign. Put it to work at once. Free.

For Canada: CANADIAN JOHNS-MANVILLE CO., Ltd., Toronto

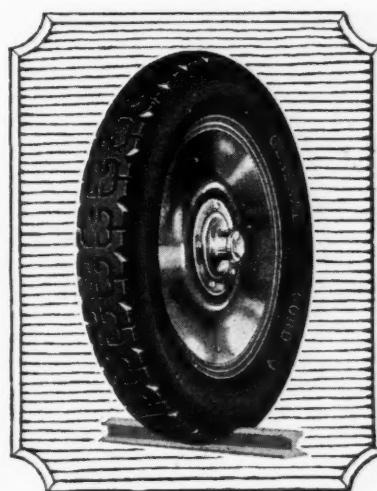
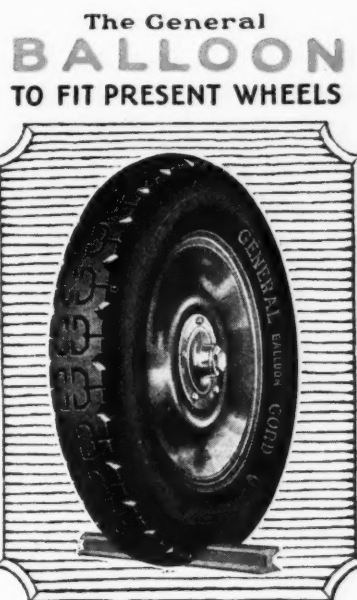
Meeting the demand for Low-Pressure in the profitable way

One reason why General distributors are so successful is because they are in position to meet the demand for low pressure to the complete satisfaction of the tire buyer. They are not limited to the sale of any one type of tire. They have the tire best suited to the buyer's needs and pocketbook, whether it is *balloons requiring special wheels*, *balloons that fit present wheels* or *regular size low-pressure cords*.

This low-pressure line, backed by the longest experience in low-pressure construction, places General distributors in the most unique and advantageous position in the tire business today.



The General
BALLOON
REQUIRING SPECIAL WHEELS



The General
REGULAR SIZE
LOW PRESSURE CORD



The

GENERAL

BUILT IN AKRON, OHIO, BY THE GENERAL TIRE AND RUBBER CO.

An illustration of a Ford truck driving on a winding, hilly road. The truck is loaded with several large wooden crates and two large barrels. The road is depicted with stylized, wavy lines to represent hills and curves. The overall tone is industrial and rugged.

for Heavy Loads

FOR the Ford Car which must navigate in the hilly country or over rough roads. For the Ford Truck. Whenever the call is for heavy duty. There is only one transmission lining which fills the bill.

The new "Thermoid."

"Thermoid" is a new departure in transmission linings. Its close textured weave is heavily reinforced, long-fibred asbestos. A special treatment renders it impervious to moisture and oil and gives it an unusual gripping power.

No lining made entirely of cotton can approach "Thermoid" either in wear or dependability under severe conditions of service.

THERMOID RUBBER COMPANY, Trenton, N. J.

New York, Chicago, Los Angeles, Detroit, Atlanta, Seattle,
Kansas City, Boston, San Francisco, Cleveland,
London, Paris, Turin

*Makers of Thermoid Brake Lining,
Thermoid Tires, Thermoid-Hardy
Universal Joints*

for Tough Sledding



The new
Heavy Duty Lining
Reinforced with
ASBESTOS

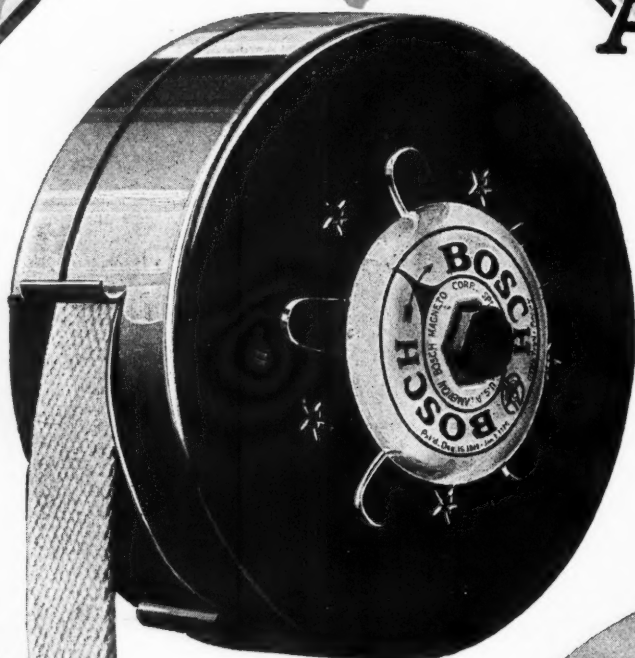
Thermoid
Transmission Lining

**FORD CARS
& TRUCKS**



The BOSCH

SHOCK ABSORBER



*Smooths
the Road*



**BOSCH
IGNITION
SYSTEM
FOR
FORDS
TYPE
600**

Insures quick, easy starts, clean plugs, added power. Has automatic spark advance—is waterproof. Prevents all ignition troubles. Price, \$12.75.



**BOSCH
ELECTRIC
WINDSHIELD
WIPER**

An absolutely reliable automatic cleaner that is operated electrically. Not affected by engine speeds. Puts no burden on the battery. Price, \$9.50.



**BOSCH
RED
SPARK
PLUGS**

The big sure firing, gas tight plug with the unbreakable insulator and the nickel steel electrodes. Get the genuine—it's red! Regular sizes \$1.00. Ford size 75c.

Long Line

To make BIG money this Summer start a drive on Bosch Shock Absorbers



Thousands of other dealers, working under the same conditions as you, have tried it and are doing splendidly—

You don't have to invest a lot of money in stock or equipment—don't have to lose a lot of time getting ready.

The preliminary work is all done. Car owners and dealers know the Bosch Shock Absorber—and know it to be a wonderfully efficient product.

Thousands of owners are using it—and praising it enthusiastically. Millions are “sold” because of the way their friends praise it,

and the dominant way it is advertised in the Saturday Evening Post and other large magazines.

That “good will” is worth real money—the dealers who feature the Bosch Shock Absorber right now are going to “cash in” big!

Don't delay—get the jump on the other dealers in your town by wiring for a sample set and starting your sales drive immediately.

We'll help you with signs, circulars and good practical suggestions—

Write for full particulars TODAY.

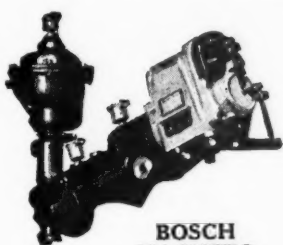
PRICES PER PAIR	
For Fords	\$10.00
<i>In Canada</i>	\$15.00
For Medium Cars	15.00
<i>In Canada</i>	\$22.50
For Heavy Cars and Trucks	20.00
<i>In Canada</i>	\$30.00

AMERICAN BOSCH MAGNETO CORPORATION

Main Office and Works: SPRINGFIELD, MASS.

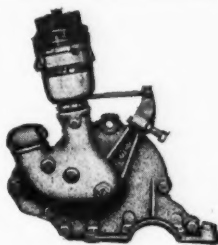
BRANCHES: New York, Chicago, Detroit, San Francisco

DEALERS: Big advantages open to live dealers who can become Bosch Sales Agents and sell the Bosch Long Line.



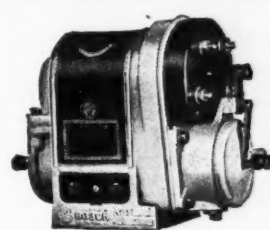
**BOSCH
MAGNETO
FOR
FORDSONS**

Provides Bosch High Tension Magneto Ignition for Fordsons. Eliminates coils and timer. Prevents all ignition troubles. Installed with, or without the Bosch Throttle Governor. Prices on request.



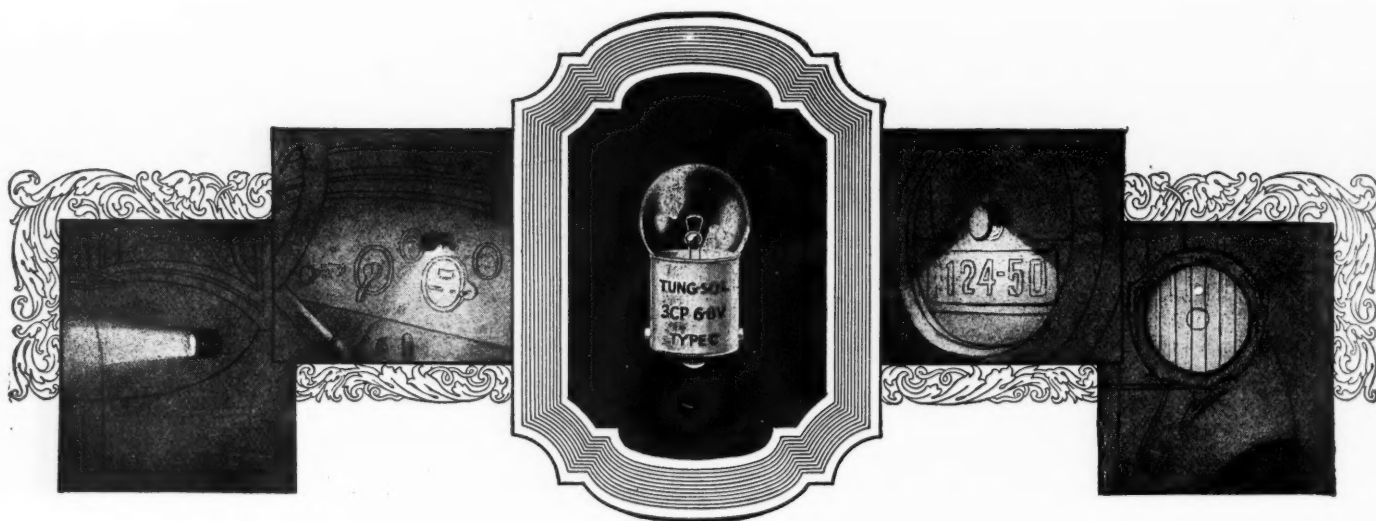
**BOSCH DE LUXE
IGNITION SYSTEM
FOR FORDS
TYPE 513**

Includes the Bosch Coll. and Bosch Compensating Governor, which automatically advances and retards the spark to exactly meet the Ford engine's characteristics. Wonderfully efficient. Price, \$25.00



**BOSCH
HIGH TENSION
MAGNETO**

The world's most dependable ignition system—over four million in use today—in demand everywhere for use on cars, trucks, tractors, motorcycles, motor boats and stationary engines. Price on request.



ANOTHER DISTINCT ADVANCE IN AUTOMOTIVE ILLUMINATION

Here at last is the bulb which car owners have been waiting for—3 candle-power, providing a *white light* of remarkable brilliancy for dash, taillamps, cowllamps and dimming headlamps. Almost every owner has experienced the feeble glow of the average small bulb—instruments difficult to read: taillamp scarcely visible: and “dimming” bulbs *too* dim to be of service. With the advent of the new TUNG-SOL 3 c. p. bulb, these difficulties become a thing of the past.

TUNG-SOL 3 c. p., 6-8 volts establishes a new standard for small bulb illumination. On the dash, this bulb enables the driver to read instruments *at a glance*: the taillamp becomes a real danger signal. In those states where there are stringent laws, the license plate may be clearly deciphered at the legal distance and when TUNG-SOL 3 c. p. are used as auxiliary bulbs in headlamps, they give ample illumination for parking purposes.

TUNG-SOL

The Quality Bulb for Motor Cars

There is a TUNG-SOL for every automotive need—head, side, tail, dash lamps. And, the TUNG-SOL “Fixed-Focus” headlamp bulb with the filament *accurately* centered. When used with a reflector having a permanently “fixed” socket, the filament is exactly at focal center of the reflector.

The perfection of TUNG-SOL 3 c. p. bulbs so closely follows the introduction of TUNG-SOL “Fixed-Focus” headlamp Bulbs that owners now look to “TUNG-SOL” for the most advanced practice in automotive illumination. Jobbers and dealers should be prepared to meet the demand created by these new TUNG-SOL features.

“Let TUNG-SOL Light the Way”

MINIATURE INCANDESCENT LAMP CORPORATION, Newark, N. J.



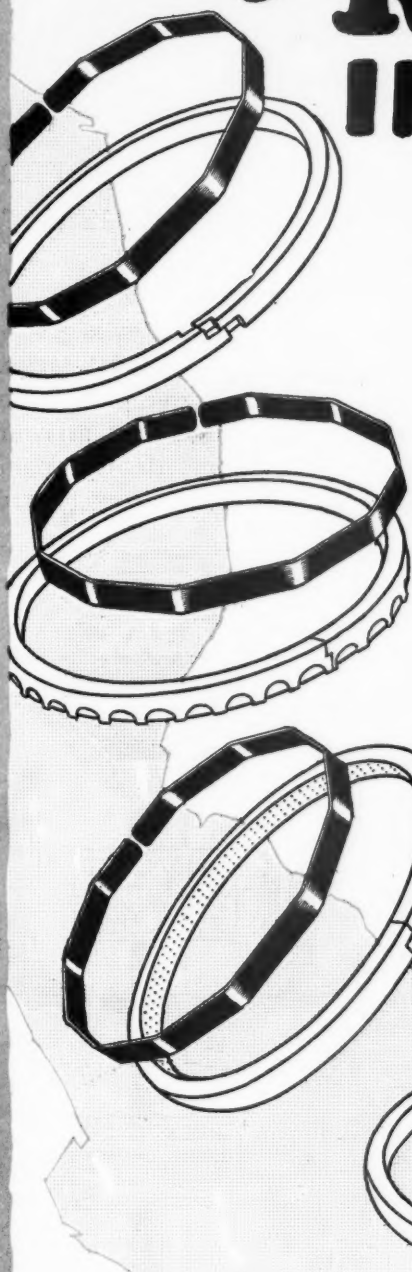
The old-style 2 c. p. bulb has a looped filament. There is a rapid decrease in candle power and the light is yellow.

This new TUNG-SOL has a concentrated coil filament like the filament in a headlamp bulb. This results in higher candle power and white light.



Licensed under General Electric Company's Incandescent Lamp Patents

With Every Piston Ring a **RAMCO** INNER RING!



No matter what piston rings you use in that job, put a Ramco Cushion Inner Ring behind each piston ring. You will notice the improvement in performance—and so will your customer. Ramcos keep the piston ring in perfect contact with the cylinder walls at any motor speed or temperature.

Ramco Cushion Inner Rings are absolutely guaranteed to stop oil-pumping and piston slap, together with such subsequent motor troubles as poor compression, carbon, and oil dilution.

Sealed for Your Protection

Every individual carton of Ramco Cushion Inner Rings is sealed immediately after packing. If the seal is unbroken, you need only look for the Ramco trade mark on the top to be assured of Ramco quality. Inner Rings must represent perfect circular tension like good piston rings—beware of cheap imitations.

RAMCO

Cushion

INNER RINGS

RAMSEY ACCESSORIES MANUFACTURING CORP., ST. LOUIS, MO.

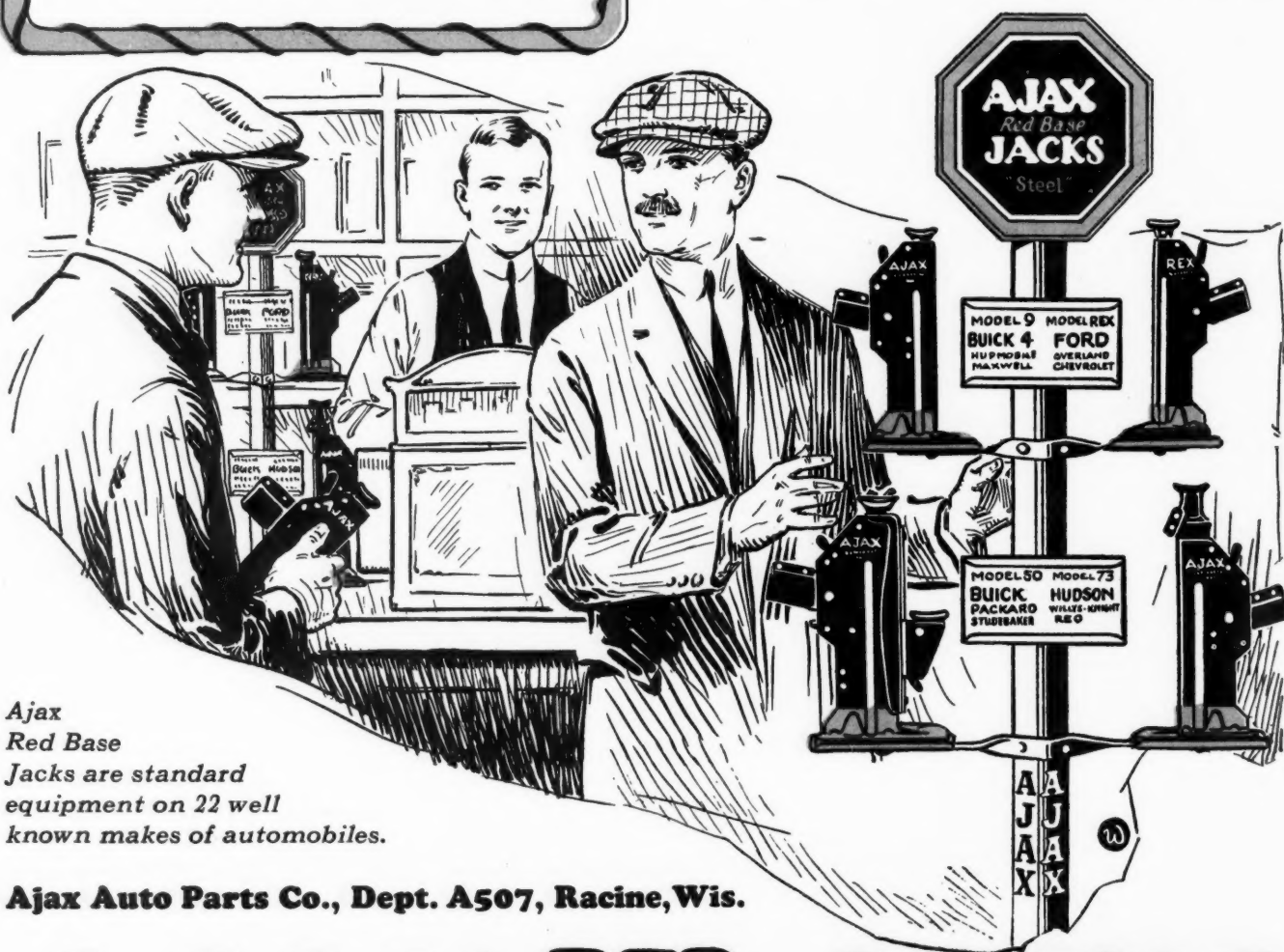
Keep Your
Jack
Investment
Working

IF YOU are handling a so-called "Complete" line which contains "stickers," part of your jack investment is not working.

Why not sell the Ajax Red Base Jack line?

It contains only 4 models, every one of which is a rapid, steady seller.

The display stand shown below is given FREE to dealers with an order for 12 jacks. This stand not only reminds everyone who enters your place to buy a jack but answers their questions as to proper size, lifting capacity, etc. Ask your jobbers' salesman about it or write us.



Ajax
Red Base
Jacks are standard
equipment on 22 well
known makes of automobiles.

Ajax Auto Parts Co., Dept. A507, Racine, Wis.

AJAX RED BASE JACKS

New Timer Doubles Sales for Thousands

Bakelite Case — short-circuit-proof and trouble-free — plus dominant advertising in the big national magazines!

That combination has made the Milwaukee by far the fastest selling timer in history.

Logical, isn't it, for this timer to be so popular? Ford has always used a roller-type timer, and the Milwaukee is a fine and famous roller-type — perfected by a Bakelite case.

No increase in price! Every reason why you should double your timer sales!

Order from your jobber now — and display these handsome new timers in your best window and counter space. Snappy sales!

Milwaukee Motor Products, Inc.
Milwaukee Wisconsin

MILWAUKEE TIMER *for* FORDS

Bone-hard fiber race pressed to a tight fit in the Bakelite case. Remains satin-smooth for thousands of miles.

Fine steel contact points with welded stems. Locked in position. Extra thick throughout for longest life.

Only Bakelite case on a roller-type timer. Makes the Milwaukee absolutely "short-proof". Puts it in a class with high-priced ignition units.

Famous Milwaukee Timer brush assembly. Two bronze castings, fitted and gauged for accurate alignment. Hardened steel roller, finished like a ball bearing.

Display Cut-out—Free! Three-color Window and Counter display. Holds a Milwaukee Timer from stock. New process—oil colors, extra brilliant, washable. Sent free, postpaid. Write us direct.



No increase in price. Retails at \$2 (\$2.75 in Canada)

The Specialist of Distribution

He brings "factory service" to every locality.

He prevents the costly duplication of selling effort which would be necessary without him.

He spreads the cost of excellent distribution service over so many items that each item finally costs less.

His warerooms give you *locally*, a continuous World's Fair of your business.

His stocks are the reservoir which enable you to operate on the modern principles of turnover.

His accommodations can be extended to you with the wisdom and interest of one who knows you as a neighbor.

This Specialist of Distribution, your legitimate jobber, fits between you and us, as rightly as you fit between him and the ultimate consumer.

GENERAL AUTOMOTIVE CORPORATION, Chicago



FREE

Write for your copy today. The edition is going fast.

BUY RIGHT!



The important thing is the buying "hook-up"!

SE-MENT-OL

The original Radiator Repairer. The only repair guaranteed for the life of the machine. In liquid or powder form.

UTILITY BLACK AIR DRYING ENAMEL

for all parts of car. Dries firm and glossy in a few hours.

AUTOMOBILE ENAMEL

made from permanent non-fading colors. Will withstand extremes of heat and vibration.

TRANSMISSION COMPOUND

Stringy, sticky, fibrous—it adheres to gears, giving continuous un-failing lubrication.

NORWESCO PRODUCTS

cover the whole range of the dealers' and car-owners' needs.

The line is complete—and there is a sales advantage in handling one good line.



QUITE a bit of energy is put forth in this business of merchandising. Are the profits worth the effort? If your rewards are not what they should be, perhaps there is a weak spot in your merchandising program. It may be that you think your job is purely one of selling when its important phase is that of buying.

If such is the case this Norwesco Handbook will help to set you straight.

The Handbook "The Hook-up" besides describing the Norwesco plan of Dealer contact, lays down in concise, usable form the basic principles of buying as related to selling and profits.

Ask for the Handbook
The Northwestern Chemical Co.
Marietta Ohio

NORWESCO PRODUCTS



The hook-up as it affects the progressive dealer is thoroughly covered in this booklet.

A reading of the handbook, "The Hook-up," cannot fail to be of benefit whether or not you handle the Norwesco Line. Ask for your copy—Use the coupon.

Northwestern
Chemical Co.,
Marietta, Ohio

Gentlemen:

Please send me a copy of your handbook "Hook-up."

Name

Address

LOW GAS!

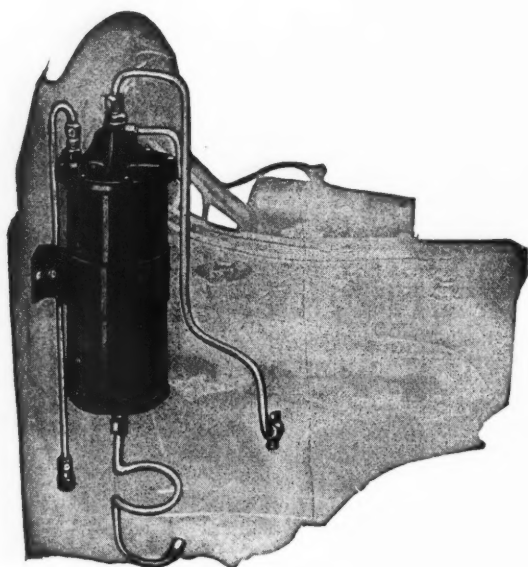
use the last drop
and take any hill
on the jump



NO GAS!

turn the stop-cock
and drive to a filling pump

No chance to get stuck with this emergency tank!



Mac's Gaselevator wipes
out all the troubles of a
gravity feed and adds the security of
emergency reserve. **\$7.50**

Mac's Gaselevator is a remarkably simple vacuum tank which feeds the last drop of gasoline in your tank to the carburetor on any grade. Even when the last drop is gone the Gaselevator hangs on to an eight-mile supply of gas until you turn the stop cock which releases it. And when the main tank is refilled the Gaselevator fills up again before you can start.

No matter if the main tank runs dry—you've still got an eight-mile supply left in the emergency tank. Mac's Gaselevator sells for \$7.50 which includes all pipe and fittings needed for its installation, a simple job taking half an hour. This is a price Ford owners will gladly pay for freedom from worry about being stranded without gas and climbing hills in reverse.

Of the 7,300,000 registered Ford owners, but few have not had this experience. Here is a vast market. A word from you will bring full information and discounts. Write today.

MOUNTAIN ACCESSORY CO.
Emporium, Penna.

Mac's Gaselevator

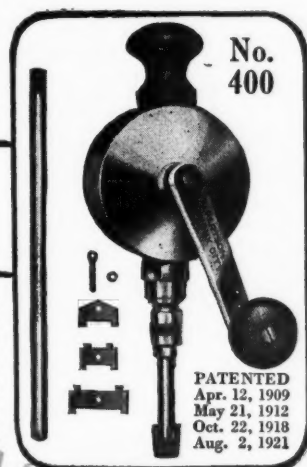
A VACUUM GAS FEED AND EMERGENCY RESERVE COMBINED



SIoux
Trade Mark Reg. U.S. Patent Office

PERFECT Valve Grinding Made Easy!

You can't do a really good job of valve grinding without the proper tool. The Sioux Valve Grinder does the job right—and does it much easier and quicker than old makeshift methods. It works on the correct principle—a continuous turn of the handle in one direction—gives the valve a full turn in one direction, alternated with a $\frac{3}{4}$ turn in the other direction, so that every part is ground to fit accurately. An end-thrust ball-bearing with a spring takes up all wear and insures smooth running and full efficiency.



PATENTED
Apr. 12, 1909
May 21, 1912
Oct. 22, 1918
Aug. 2, 1921

SIoux VALVE GRINDER

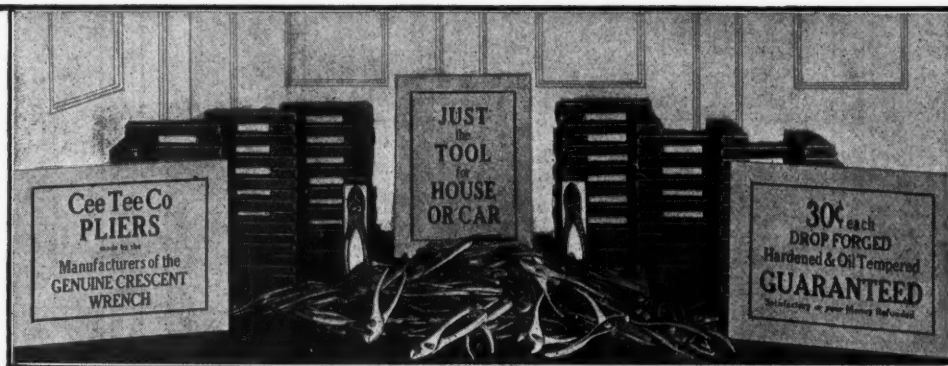
Ask Your Jobber About It

ALBERTSON & CO.

SIoux CITY, IOWA



CeeTeeCo Pliers



A CeeTeeCo window means quick sales at good profit

No accessory is in more constant demand among motorists than a good reliable plier at moderate price. No plier meets this demand quite so effectively as the CeeTeeCo.

To tell the CeeTeeCo sales story to your customers briefly, forcefully, and compellingly under conditions which encourage IMMEDIATE ACTION, we have prepared the CeeTeeCo window display assortment.

It includes a gross of CeeTeeCo drop-forged, hardened, oil tempered pliers, 6-inch size, with a supply of display material that sets forth the CeeTeeCo's features at a glance.

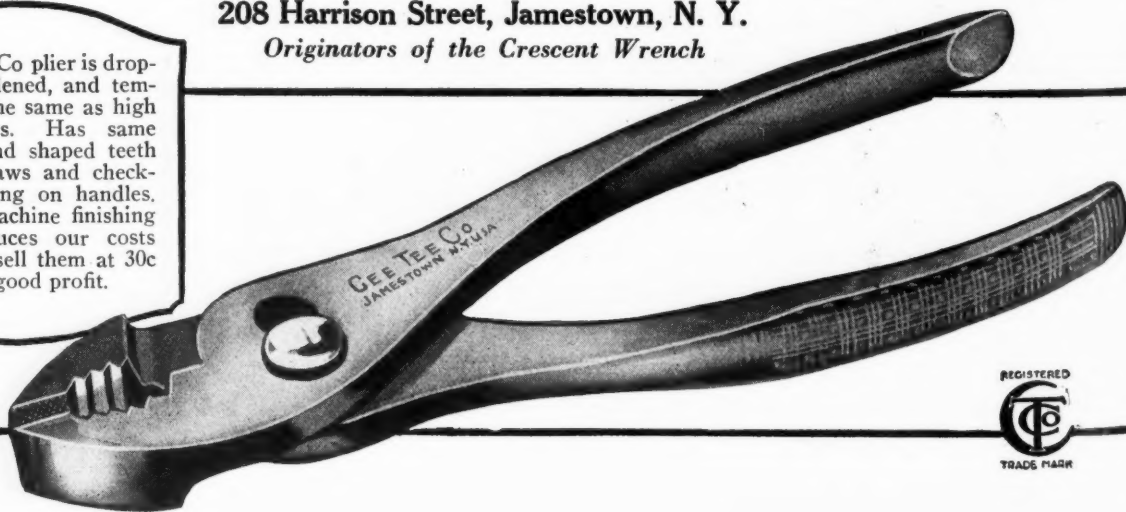
A **guaranteed** plier at 30 cents is a bargain that every motorist will be quick to recognize. And we can make **you** a price that will open your eyes. Ask your jobber.

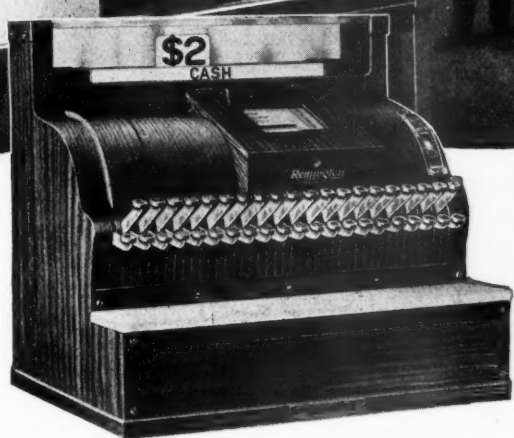
CRESCENT TOOL COMPANY

208 Harrison Street, Jamestown, N. Y.

Originators of the Crescent Wrench

The CeeTeeCo plier is drop-forged, hardened, and tempered just the same as high priced pliers. Has same style diamond shaped teeth milled on jaws and check-erdot knurling on handles. A special machine finishing process reduces our costs so you can sell them at 30c and make a good profit.





To Insure Intelligent Service on *Remington Cash Registers*

AT the factory at Ilion, N. Y., the Remington Cash Register Company maintains this Service School where men now connected with our 81 Branch Offices throughout the country were trained in the mechanism of cash registers and other am-

bitious men are learning to be expert Service Men.

Nation-wide Service is part of the program that has established the Remington as the *new and better* Cash Register.

You ought to see it.

REMINGTON CASH REGISTER CO., Inc.

Factory and General Sales Office, Ilion, N. Y.
Subsidiary of REMINGTON ARMS COMPANY, Inc.
Makers of Remington Firearms, Ammunition and Cutlery
In Canada: Remington Cash Register Company of Canada, Ltd.
557 Yonge Street, Toronto, Ont., Canada

Akron, Ohio
Albany, N. Y.
Atlanta, Ga.
Baltimore, Md.
Binghamton, N. Y.
Birmingham, Ala.
Boston, Mass.
Bridgeport, Conn.
Brooklyn, N. Y.
Buffalo, N. Y.
Charlotte, N. C.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
Dallas, Tex.
Davenport, Ia.
Denver, Colo.
Des Moines, Ia.
Detroit, Mich.
E. St. Louis, Ill.

Fargo, N. D.
Fort Worth, Tex.
Fresno, Calif.
Grand Rapids, Mich.
Harrisburg, Pa.
Hartford, Conn.
Houston, Tex.
Indianapolis, Ind.
Jacksonville, Fla.
Jersey City, N. J.
Kansas City, Mo.
Lansing, Mich.
Little Rock, Ark.
Los Angeles, Calif.

Louisville, Ky.
Madison, Wis.
Memphis, Tenn.
Miami, Fla.
Milwaukee, Wis.
Minneapolis, Minn.
Nashville, Tenn.
Newark, N. J.
New Haven, Conn.
New Orleans, La.
New York City
Oakland Calif.
Oklahoma City, Okla.
Omaha, Nebr.

Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Me.
Portland, Ore.
Providence, R. I.
Reading, Pa.
Rochester, N. Y.
Sacramento, Calif.
Salt Lake City, Utah
San Antonio, Tex.
San Diego, Calif.
San Francisco, Calif.
Scranton, Pa.
Seattle, Wash.

Sioux City, Ia.
Spokane, Wash.
Springfield, Mass.
Springfield, Ohio
St. Louis, Mo.
St. Paul, Minn.
Syracuse, N. Y.
Tacoma, Wash.
Tampa, Fla.
Toledo, Ohio
Toronto, Ont.
Trenton, N. J.
Utica, N. Y.
Vancouver, B. C.
Washington, D. C.
Wheeling, W. Va.
Wichita, Kan.
Wilkes-Barre, Pa.
Wilmington, Del.
Yonkers, N. Y.
Youngstown, Ohio

There is a Remington Cash Register built to fit your business. Get in touch with the Office nearest to you, and you will find our representative there willing and glad to make a complete demonstration.



Imagine a radiator that would dwarf the Woolworth Building! Yet a single month's output of Harrison Radiators rolled into one would do it.

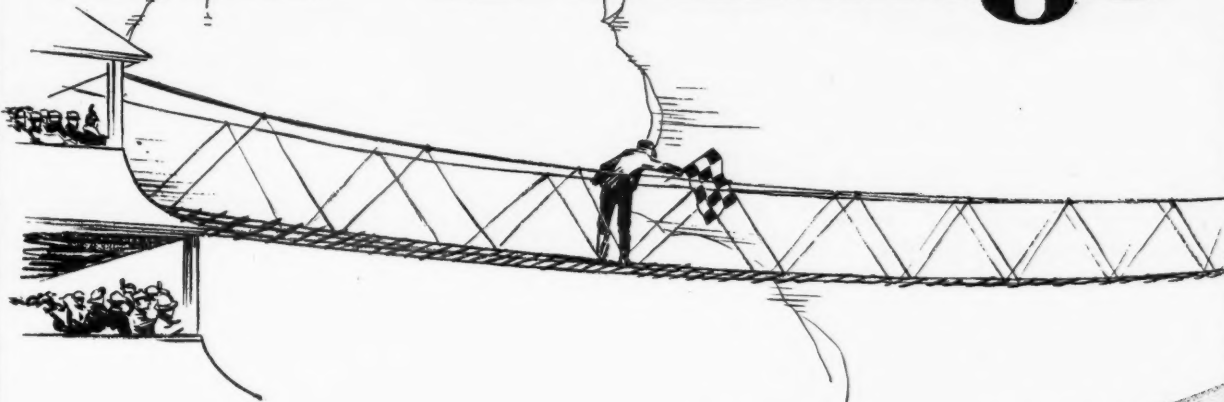
HARRISON RADIATORS

HARRISON RADIATOR CORPORATION, LOCKPORT, NEW YORK



THE MARK OF RADIATOR SATISFACTION

New Departure Ball Bearings



—But That's Not the Point

To have New Departures in 16 of 18 cars that finished at Indianapolis is both an honor and a distinction, to be sure—

But the big thing to remember is that New Departure quality is so impressed on the minds of men that New Departure is, naturally, the choice wherever the utmost is demanded in bearing performance.

New Departure outsell because they excel.

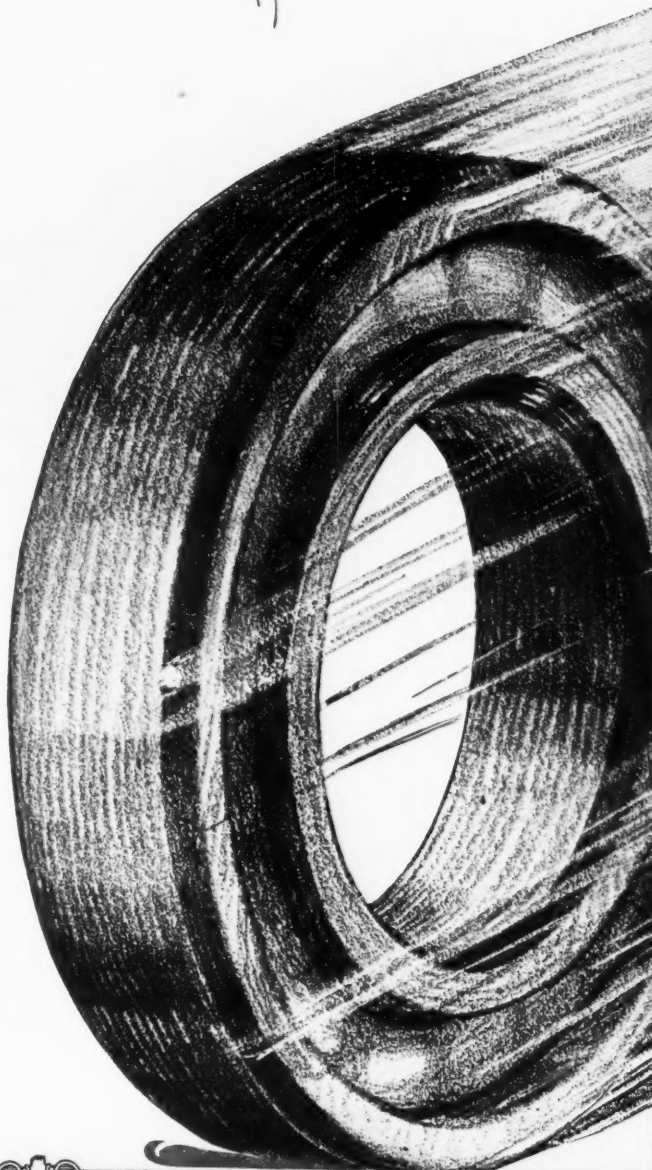
THE NEW DEPARTURE MFG. COMPANY

Bristol, Conn.

Detroit

Chicago

London





Jacobs Chucks have gained their sound reputation because they do a chuck's work better and continually deliver more than a full measure of service.

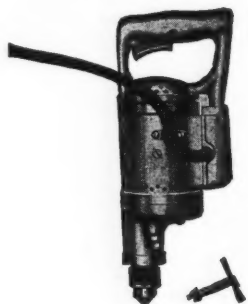
This accounts for their adoption by 132 makers of Drilling Machines and Portable Drills.

THE JACOBS MFG COMPANY, HARTFORD, CONN.

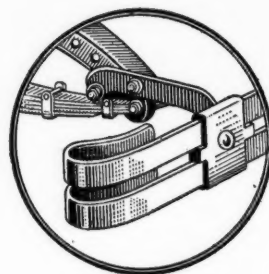
This advertisement inserted in the interest of better Service Equipment in general and the use of Portable Electric Drills in particular



CLARK
AUTOMATIC
DRILL



Jas. Clark, Jr.,
Electric Co., Inc.
Louisville, Kentucky



An all year job

The portable drill has an all year job and attaching a bumper is only a small part of its duty.

But a close, accurate fit can be secured with a good electric drill in much less time than by the antiquated and costly hand drill method, thereby saving the valuable minutes and consequently adding to the profit account.

The World's Largest Producer of Drill Chucks



Customer, clerk and proprietor— Sundstrand triple service protects them all

Whether it's a cash, charge, paid-out or received-on-account transaction,—Sundstrand automatically enforces correct and immediate recording and printing of all the facts, including clerk and department numbers.

Customers knows there will be no disputes; clerk knows he will get credit for all sales; proprietor operates his business with confidence and peace of mind.

The Sundstrand protects your profits, gives you the definite, absolute facts and figures for the right running of your business. Three services, from *one* machine, at *one* low cost.

1.—Cash Register—Classifies sales by clerks and departments. Makes a non-erasable record. Enforces correct indication and recording of cash, credit, paid-out, etc. You read cash total any time. Tape rewinds and locks in machine. Can't forget and won't let the clerk.

2.—Adding Machine—Famous 10-key Sundstrand adding machine—adds, multiplies, etc. Saves time, effort and prevents errors in checking sales slips and inventory sheets, footing ledger, bank balances, etc. Range 1c to \$99,999,999.

3.—Credit File—Names visible. Balance due posted to date. You make settlements from original sales slips. Statement goes with each purchase. Put trays in safe at night, the only real fire protection. Holds 90 credit accounts, 2700 sales slips, add more trays if desired. Saves hours of bookkeeping.

Sundstrand COMBINATION CASH REGISTER

ADDS—MULTIPLIES—AUTOMATIC CONTROL—FORCED (CORRECT) INDICATION

Ask us to show you in your own store. Or write. Address Dept. M-7.

Sundstrand Adding Machine Co., Rockford, Ill., U. S. A.

Sales and Service Stations everywhere in the United States and foreign countries

What? Who? Where? The Service Equipment Associates?

MEMBERS

Service Equipment Associates

Albertson & Co., Inc.
Sioux City, Iowa

T. R. Almond Mfg. Co.,
Ashburnham, Mass.

Bastian-Blessing Company,
(Rego) Chicago, Ill.

The Black & Decker Mfg. Co.,
Towson, Md.

Bonney Forge & Tool Works,
Allentown, Pa.

Brunner Mfg. Co.,
Utica, New York

Burton-Rogers Company,
Boston, Mass.

Continental Sales Corp.,
Columbus, Ind.

Kellogg Manufacturing Co.,
Rochester, N. Y.

The Manley Mfg. Co.,
York, Pa.

Wood-Imes Mfg. Co.,
Minneapolis, Minn.

Oxweld Acetylene Company,
New York, N. Y., and
Chicago, Ill.

Stevens & Company,
New York, N. Y.

Van Norman Machine
Tool Co.,
Springfield, Mass.

Weaver Mfg. Company,
Springfield, Ill.

Weidenhoff Products,
Chicago, Ill.

Wright Mfg. Co.,
Lisbon, Ohio



"The Best-Equipped Shop
Gets the Business"

These questions are frequently asked by those who see our advertisements.

The Service Equipment Associates at present consists of 18 well known manufacturers of automotive service equipment shown opposite, and the products of these manufacturers represent almost every known kind of time and labor saving machinery for automobile, truck, tractor, bus and aeroplane maintenance.

No claim is made that these are more reputable than any one who is not a member of the S. E. A.

No claim is made that the products of the Service Equipment Associates are the only safe products to invest in.

We naturally want you to buy our products, and the names listed opposite doubtless mean more to you than any statements that we could make.

The Service Equipment Associates are in business to sell more service equipment, but believe this may be done by helping *you* to sell more service.

We are convinced that if you men who are servicing cars, trucks, tractors, etc., will "sell service," you will find yourselves constantly in need of better equipment to enable you to turn the work out.

If we are successful in this, we all benefit.

So you may consider the Service Equipment Associates as a sort of Central Committee working to promote better service, and this, of course, means better equipment.

The names and addresses shown opposite tell you "Who and Where."

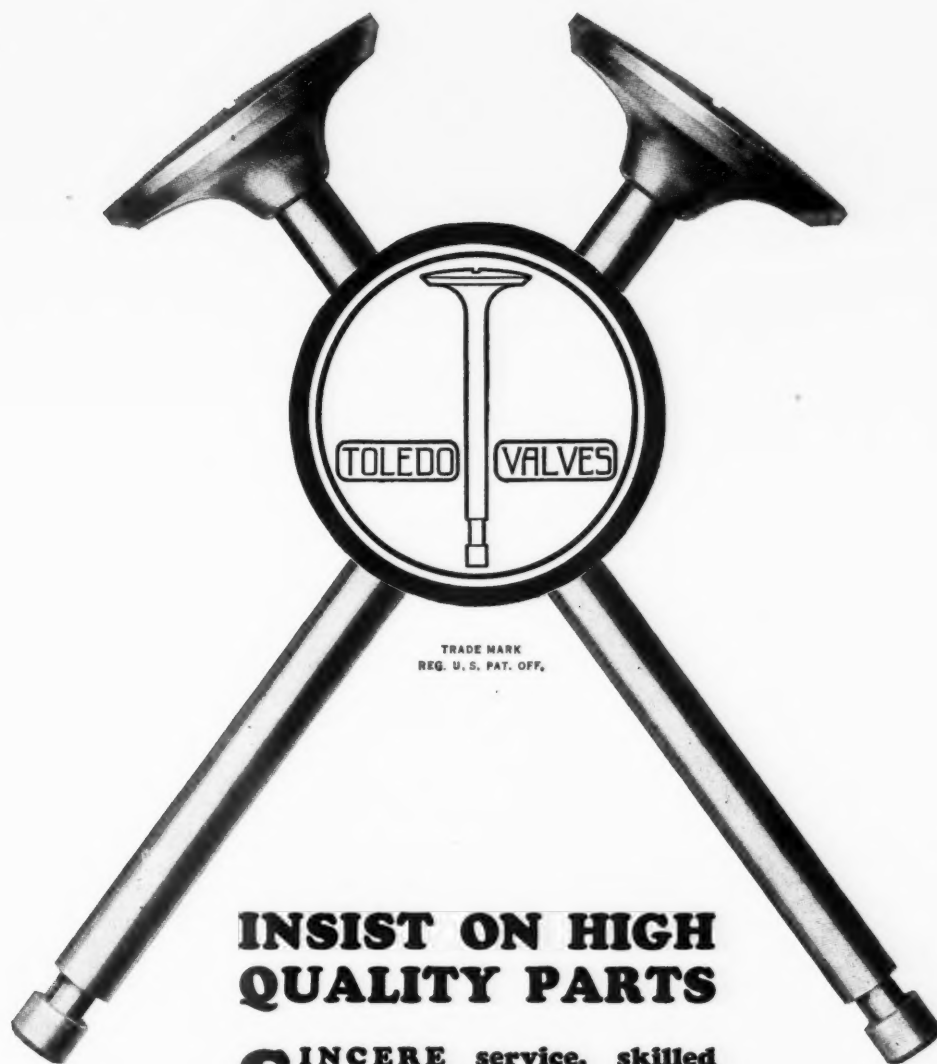
Our slogan is, "The Best Equipped Shop Gets the Business," and the smiling mechanic "Larry" is a symbol to remind you of

SERVICE EQUIPMENT ASSOCIATES

TOWSON

MARYLAND

Or Communicate with any member of
Service Equipment Associates listed at left



INSIST ON HIGH QUALITY PARTS

SINCERE service, skilled workmanship, fair dealing and unfailing courtesy will not build a shop business for you if poor parts and material get into your operation.

Your labor and the car owner's money are well invested when you install Toledo Standardized Valves. You can now buy them from your jobber for all replacement needs.

Install them by the set to get best results.

THE TOLEDO STEEL PRODUCTS CO.
TOLEDO • OHIO

MANUFACTURERS OF VALVES EXCLUSIVELY FOR OVER TEN YEARS



Model
H 60

Pat.
Appl'd
for

Bigger Profits

for Garages & Repair Shops

New, Simplified Equipment Finishes 30 Connecting Rods Per Hour!

Double your shop production with Hempy-Cooper Universal Connecting Rod Equipment. Consists of two new money-making inventions that are rapidly gaining favor with garage men everywhere. You can take in more work, do it in less time and do it better! Naturally this means more profits for you as well as greater satisfaction for your customers.

One machine (Model H 60 Babbitting Jig) casts babbitt bearings into rods of all makes of cars using "cast-in," "shell" or "set-in" bearings. The other machine (Model C 70) then bores and fillets the bearings. Very rapid and accurate to a thousandth of an inch. Both are practical and simple to operate. Priced so low they soon pay for themselves.

Model H 60

The machine above is the model H 60 Hempy-Cooper Universal Connecting Rod Babbitting Jig. Equipped with mandrel for casting an oil groove into bearings. Change parts from one type rod to another in less than two minutes.

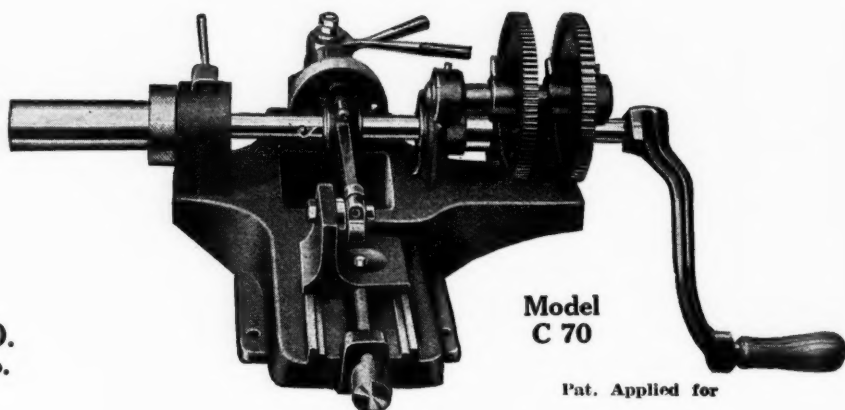
Model C 70

The Model C 70 Hempy-Cooper Machine (shown opposite) is operated either by hand power or electric drill. Equipped with the famous patented helix screw feed.

Write At Once

Learn all about these two new inventions. Let us show you how to make and save money with them. A letter brings you full information, prices, etc. Write today! Address Dept. M. A.

THE HEMPY-COOPER MFG. CO.
422 Archibald Ave., Kansas City, Mo.



Model
C 70

Pat. Applied for

HEMPY-COOPER

Rebabbitting Appliances

First of All — "Reliability"

Armature Rewinding (We like to call it "Re-NEW-ing") has been raised to the degree of PERFECTED PRODUCTION thru the equipment and skill used in our shop.

Quality dictates our price for rewinding. Our guarantee has more back of it than the mere impression.

"To give the same service as a new armature" — it says — and means that it has the material and workmanship in it to give it this ability.

Put a U. S. Rewind to a service test.

U.

S.



FORD ARMATURE
Rewound \$2.

Any Two-unit Generator Armature
Rewound \$5.

One Day Service

Guaranteed Armature Rewinding is as near to you as the nearest mail box. There's a new profit for you in this method of armature replacement.

We'll ship the same day received from stock or rewind your particular armature if specified.

DISTRIBUTOR OPPORTUNITY

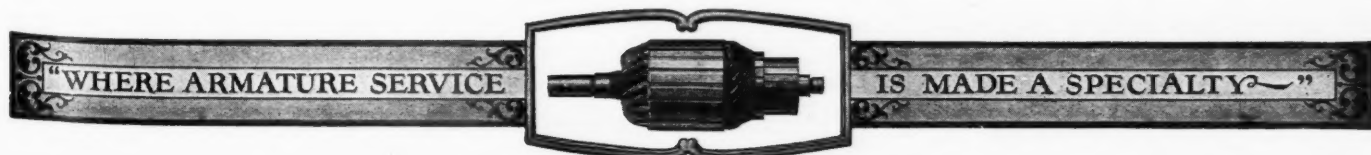
We have an unusually attractive proposition for distributors. Write for our plan.

U. S. AUTO SUPPLY CO.

Armature Rewinding Division

3845 S. Wabash Ave.

Chicago



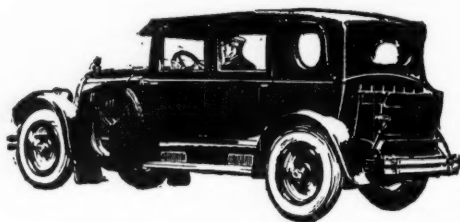
KISSEL

CUSTOM  BUILT

Kissel is one of the few companies in the automobile industry that has never been reorganized, or changed in management or ownership.

Kissel's outstanding success over a period of eighteen years is due primarily to the rare distinction of the product and its unvarying high quality.

KISSEL MOTOR CAR COMPANY
Hartford, Wisconsin



KINGSTON products ***have been known to motorists*** ***for a Generation***

KINGSTON Ignition devices have been known to motorists for more than a quarter of a century. The experienced dealer knows that there will be, day in and day out, a steady and remunerative demand for products of the Kingston line.

It is this factor that has made the Kingston line so popular with dealers everywhere. They know that every motorist knows Kingston products, that motorists have been buying them for years, and will continue to buy them. Correctness of design, the test of materials and the utmost care in workmanship have contributed to that unswerving confidence that motorists everywhere have in the name Kingston.

Most dealers are cashing in on this steady demand, and have been for many years. For the dealer who is not acquainted with Kingston products, or who does not feel that he is getting his full share of this business, we have an interesting story to tell. Drop us a line.

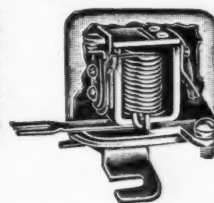
KOKOMO ELECTRIC COMPANY

KOKOMO, INDIANA

KINGSTON GENERATOR CUT OUT

LIST PRICE **\$1 00**

Wise dealers know there is no better Cutout at any price than the Kingston. It is expertly made, and is built to last. Furnished with curved base to fit the Ford generator or with flat base for use on any six-volt system.



KINGSTON COIL UNIT

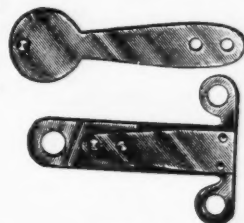


MILLIONS of Kingston Coil Units are in use. They have given excellent service on Ford cars for many years, and are recognized as wholly dependable.

LIST PRICE **\$1 75**

KINGSTON POINTS

Kingston Contact Points are extra large in size, and are suitable for use both on Ford cars and Fordson tractors. Buy the genuine!



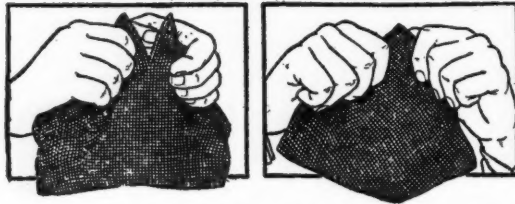
LIST PRICE
**20c per
set**

KINGSTON

GATES BELTS

"The Standardized Fan Belt"

Try this test



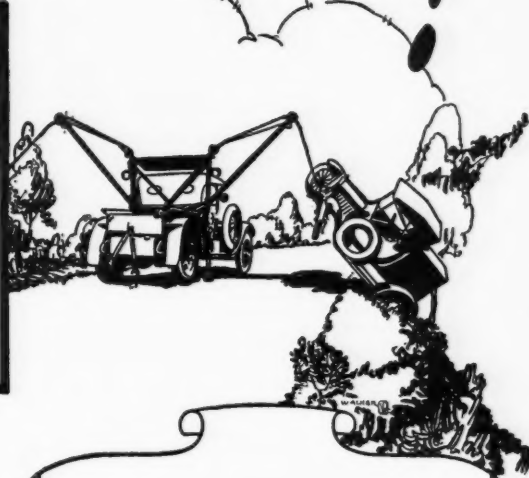
Take a piece of light fabric that you can tear easily in this manner—that is, straight across. Then try to tear it *diagonally* as in the next picture.

You find that it has double strength *on the bias*—a good illustration of the extra strength and durability of the *bias weave* construction.

A simple test like this will show your customers exactly why Gates Vulco Belts are giving them better wear and satisfaction.

Made by the World's Largest
Manufacturers of Fan Belts.

Don't Block Traffic!



A Holmes Wrecker puts a wreck on the road in the fastest possible time because the operator works without interruption. He does not bother traffic. Traffic does not bother him. When he comes up to the scene of a wreck he stops at the roadside headed straight up the road and not across it—He anchors one of the two swinging booms to a fixed object leaving plenty of room for traffic to pass beneath it. (See photo. above.) He fastens the other boom to the wreck. The road is left clear. Out comes the wreck without any delay.

This time and labor saving arrangement is an exclusive Holmes feature made possible by the use in Holmes Wreckers of free swinging double booms. No other wrecking equipment has them.

Without swinging booms you can't get Holmes flexibility. Without Holmes flexibility you can't get Holmes efficiency and Holmes operating economy.

Write today for new Holmes catalog. Contains facts about the wrecking business—Actual experiences and details about earnings, together with full information about all three of the fine Holmes Wreckers and other Holmes garage and shop equipment. Address your jobber or this company.

ERNEST HOLMES COMPANY

CHATTANOOGA,

TENNESSEE

15 EXCLUSIVE HOLMES FEATURES

1. 100 Foot Operating Range.
2. **DON'T BLOCK TRAFFIC**
3. Transfers Load to the Road.
4. Easy, Comfortable Operation from the Ground.
5. "V" Tow Bars.
6. Swinging Booms.
7. Double Booms.
8. Electric Lights for Night Work.
9. Two Speeds.
10. Full Floating Low Speed Power Shaft.
11. Independent Boom Control.
12. Perfect Balance.
13. Hand or Power Driven.
14. Steel Body.
15. Cable Guards and Guides.



You can turn that "morgue" into cash, Mr. Jobber!

Don't tie up your capital in big inventories. Get rid of that "morgue" in your store or warehouse and have more capital as well as space for items which have a ready sale *in your territory*.

All the accessories, parts, equipment for which there is no local demand you can sell at a price that will make their clearaway *profitable*.

Someone somewhere wants to buy those items you want to sell. And he, in turn, may have something you would be glad to buy "at-a-price."

The more than 80,000 readers of Motor Age, Motor World and Automobile Trade Journal are the active dealers, jobbers and garagemen—and excellent prospects for just those things you want to sell. You can reach these progressive, prosperous prospects through a Broadcaster advertisement.

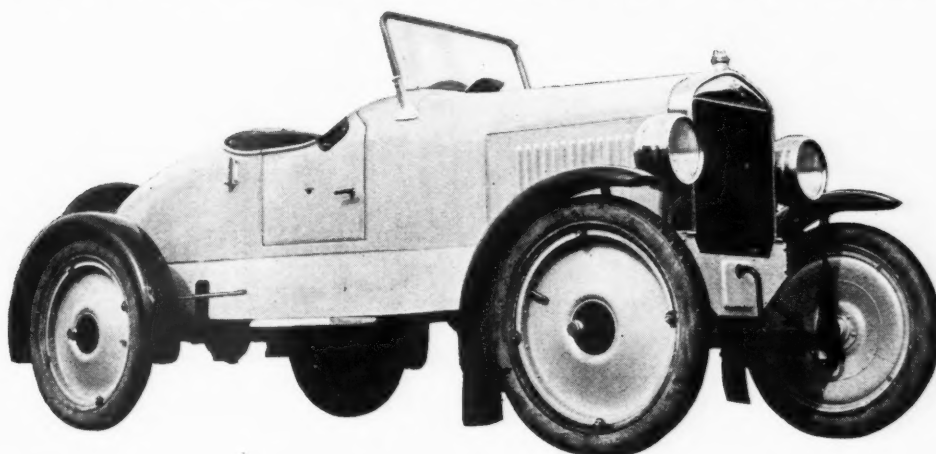
You can afford Broadcaster advertising. The cost is slight. Undisplayed ads are 6c a word in Motor Age or Motor World; 10c a word in the big monthly Automobile Trade Journal.

The Broadcaster

A DEPARTMENT THAT
WILL FIND WHAT YOU WANT

For Broadcaster rates in Motor Age, Motor World, Automotive Industries, Automobile Trade Journal, Distribution & Warehousing, address the Class Journal Company, 5 So. Wabash Ave., Chicago, Ill., or 239 W. 39th St., New York.

THERE'S MONEY IN KNOWING ALL ABOUT THE LATEST MERCURY HIT!



NEW— Super Sportabout Body for Fords

A fine new lot of profits—and repeat profits—for Dealers and Distributors. Great attention value. A real money-maker in the Sport Roadster field.

This Mercury Body for Fords increases new chassis sales—turns over used car stocks—pays dividends in advertising itself, and brings back customers for added extras.

A QUALITY body job—but selling at a price easily within reach of the majority—with a discount worth your while.

All 18 gauge stamped steel—all seams welded, making a rattle-proof one-piece body. All fittings are nickel plated or polished aluminum. Trimming of imitation leather of finest grade. Attractive body colors that sell. Retains distinctive Ford features such as radiator and shell, fenders, dust-shields, etc. No mechanical changes.

FORD DEALERS: Let us tell you how to sell from TWO to TEN or MORE new Ford Chassis with MERCURY BODIES to ONE MAN in your town. Don't miss this bet!

LIST

\$198

f. o. b. Louisville, Ky.

Top, top bows, and side curtains, EXTRA, list \$25.

Other extras as shown in illustration: Splasher group, Individual steps and fenders, disc wheels, Mercury Barrel Type Lamps.

The pride of The Mercury owner leads to sales of Mercury extras such as: Mercury drop axles and rear frame lowering channels; individual fenders, wire or disc wheels, as well as those mentioned above.

They all give the dealer REAL extra profits.

MERCURY BODY CORPORATION

LOUISVILLE, KY.

Specialists in Super-Smart Sportabout Bodies for Fords and Chevrolets

Mail This Now



**DEALERS &
DISTRIBUTORS**

Mail the coupon for
Photos & Details

Mercury Body Corporation,
Louisville, Ky.

You may send photographs and particulars of the
new Mercury Super Sportabout Body for Fords

Name

Address

City State

The lines we now handle are:.....

Dealer

☐

Distributor

☐

We Have The Selling Organization!

Have You The Product?

Our national organization is producing a big volume of business on several articles, garage equipment and accessories, but we can effectively handle two or three more items. If you are having trouble with your distribution write us at once.

Our sales force is personally acquainted with the trade. It can save you a lot of money because it knows the line of least resistance in selling.

Quit experimenting with men and methods.

Get your contact without cultivating acquaintanceship.

Be free to superintend production and policy.

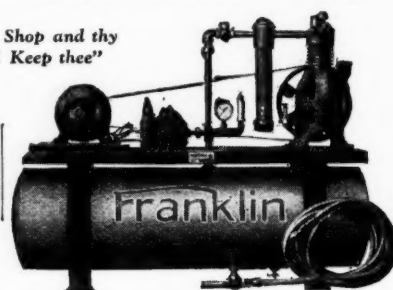
We have been automotive manufacturers' representatives for ten years.

Only two, or perhaps three additional lines considered. Bumpers will be one of them.

For conference communicate with "Sales Organization,"

**Box 6154 care Motor Age
5 So. Wabash Ave.,
Chicago, Illinois**

"Keep thy Shop and thy
Shop will Keep thee"



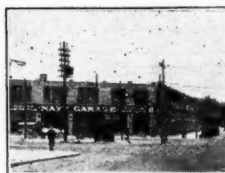
Put the Difference in Your Cash Box

THE OWNERS of the Navy Garage, in Philadelphia, have done that very thing. With a two-story garage of 300 cars capacity, they are using a Franklin Super-Single-Stage Air Compressor—the "one model compressor"—and it is doing the work of a much higher priced compressor.

The Franklin is made in only one model for one big reason—you don't need any other kind. The Franklin outfit, with its one-half horsepower standard motor, is able to take care of any size garage or service station; it is able to pump air for as many cars as you bring on.

Every part of the Franklin is designed for real work—strong, durable, the best mechanical construction and thoroughly tested before leaving the factory. All replacement parts are standard. The

Franklin, with its new spiral-fin super-cooling cylinder, is a marvel of efficiency. The spiral fins add 15% more radiating surface, allowing the hot air to rise naturally. This assures you a cool and efficient motor. It is the first real advance in air compressors for a generation.



Navy Garage, Phila.

Why pay from \$400 to \$600 for an air compressor with fancy accessories and complicated parts when you can buy a simply designed, dependable Franklin for only \$225. The Franklin Super-Single-Stage Air Compressor will do the work of any larger or higher priced compressor—it will save money for you in its first cost and in operating expense. Air compressor troubles are gone forever when you use a Franklin. Order from your jobber today, or write for full particulars.

Franklin Super Single Stage Air Compressors

FRANKLIN AIR COMPRESSOR WORKS
2604 Main Street - - Norristown, Penn.

We make the Franklin Air and Water Station

71,149,500 Piston Rings due for replacement

Guaranteed
1000 miles
to the
Gallon of Oil

Our positive mileage guarantee
will help you get your full
share of this business



Statistics show that 71,149,500 piston rings are due for replacement this year. It represents a tremendous volume of repair service for some dealers and garagemen.

How much of this profitable business you get depends largely upon the kind of rings you have to sell and upon the strength of their sales appeal.

You are sure of getting your full share, and then some, if you are selling Sav-Oil rings, because—you can **guarantee** results or refund the money. This exclusive Sav-Oil feature makes it easier for your customer to say "Yes" than "No".

Eliminate the sales resistance of your customers—get a stock of these guaranteed oil rings from your nearest distributor—and see for yourself.

Territories Open for Distributors

Sav-Oil Piston Ring Co.
2056 Jackson Blvd.
Chicago, Ill.

Sav-Oil Ring Mfg. Co.
550 Golden Gate Ave.
San Francisco, Calif.

H. C. Alexander
612 W. Seventh St.
Little Rock, Ark.

H. W. Blevins
1532 Grand Ave.
Kansas City, Mo.

C. H. Mountjoy & Co.
211 Third Street
San Antonio, Texas

The Sav-Oil Ring Mfg. Co.

1037 So. Figueroa St.

Los Angeles



Put a New Heart in the Ford

Discouraged Fords, tired of trying to give first-rate service with second-rate ignition units, take on a new lease of life when equipped with Bell Timers.

BELL TIMER

"Built Like a High-Grade Distributor"

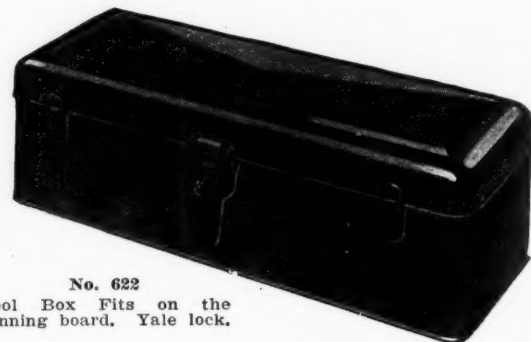
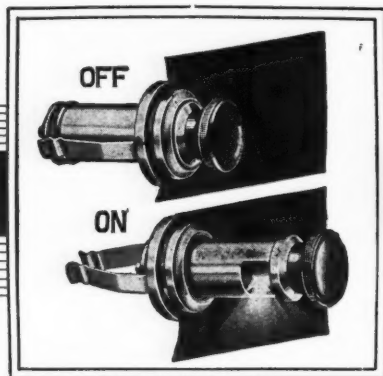
will give your customers thousands of miles of smooth trouble-proof service without oiling or attention. Bell is the leader in its field because it combines

1. Wipe contact
2. Solid copper brush
3. Solid copper contacts
4. Solid Bakelite shell

Your jobber carries Bell Timers

Bell Manufacturing Company
13 Elkins St. Boston 27, Mass.

Makers of the ingenious
BELL DASH LAMP
for Fords and other cars



No. 622
Tool Box Fits on the
running board. Yale lock.

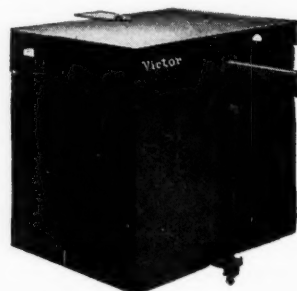
Light Weight Safes—Safe



No. 812
Battery box for
the running board.
Yale lock.



No. 812-F
Same as No. 812.
No lock. Lid held
by suitcase catches.



No. 811-A
Protects battery
hung under Ford.
Fits late models.

Victor Battery and Tool Boxes are made of 22 gauge cold rolled steel, accurately formed and finished. They are strong, sturdy and rattleproof. Two coats of brilliant black enamel are baked on. These boxes are of the same high quality as the Victor line of lamp accessories.

The same style as No. 622 is made in the following sizes: No. 622—7¼ in. high, 22 in. long. No. 625—7 in. high, 25 in. long. No. 822—10½ in. high, 22 in. long. All of convenient width to fit on running board.

Battery boxes No. 812 and 812-F are 12 in. x 8 in. x 10½ in. They give full protection to the battery. A hole for the cable is provided in the rear.

No. 811-A protects the battery when installed underneath the Ford car. A sturdy bracket is provided to make the installation. Stock this real quality line of boxes along with the lamp accessories.

Tool and Battery BOXES



The Cincinnati Victor Company
714 Reading Road, Cincinnati, Ohio



Bumps and Wear

Pressure Lubricated cars ride easier and steer easier. Pressure lubrication reduces wear to a minimum and cuts repair bills. If ever anyone needed pressure lubrication it is the tourist. It will save him the cost of his set many times over in one summer. He is a prospect.



Tire Trouble

Tires never seem to go bad on a tourist when free air is handy. It is always miles from nowhere. The tourist who starts his trip with a cheap tire pump has picked himself a summer of hard work. Sell him an easy pumping Rose. The Rose is almost universally the favorite among tourists.



Sell Rose Products From This Display— It's Free

Sales are easy to make from this new Rose Merchandiser. It catches attention and arouses the interest. It invites inspection and takes these money makers out of the "shelf goods" class. The Merchandiser is free to you with the purchase of the goods it displays. Ask your jobber.

Tourists Need'em

Take your tourist customers over to your new Rose Merchandiser and tell them why they should have both a Rose Tire Pump and Rose High Pressure Lubricator before they start the long trip.

These are highly profitable sales you might otherwise let slip.

The tourist knows the Rose name and reputation. He is a live prospect.

ROSE

TIRE PUMP and LUBRICATOR

Frank Rose Mfg. Co., Hastings, Nebr.

These Products Win Customers

The success of Brookins Products has been due entirely to one thing,—and that is their ability to help any garage or service station win customers' good will, get more customers, increase trade, build up profits. The Brookins Measure is the standard oil measure of the world today. Other Brookins Products, shown below are climbing steadily toward the same world leadership.

The Brookins Oil Measure



The most convenient, efficient and durable of all oil measures. It has a flexible metal nozzle that reaches any oil hole without the use of a funnel. Oil flow is started, stopped, controlled by a thumb-valve operated at the rim. A wide lip prevents spilling when brim-full. Made in one, two, four and five-quart sizes, all copper-finished.

Brookins Instant Price Charts



Permanent steel charts, lithographed on both sides and weather-proofed by baked enamel. Each chart shows price per gallon and corresponding quantity prices from one to twenty gallons. Supplied in both even cents and half-cents. Complete price range in each set. Chart fits directly on pump—can be changed instantly. Insures accurate price quotation—eliminates disputes.

The Brookins Emergency Gas Can



A sturdy two-gallon can, fitted with a flexible metal tube instead of a spout. Carries any distance without spilling. Flexible tube reaches any gasoline intake port without funnel—no spilling, no waste, no danger. An emergency service can that will be appreciated by every customer.

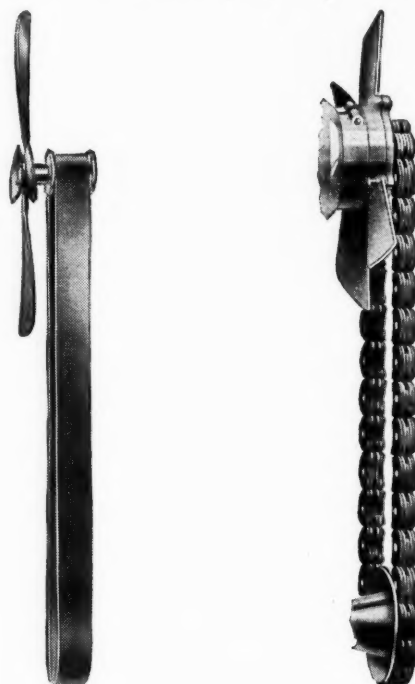
Brookins Products are carried in stock by most jobbers. If your jobber hasn't them—write us for samples and prices.

THE BROOKINS MFG. CO., DAYTON, OHIO

Brookins
SERVICE STATION EQUIPMENT



Two money-makers



INCREASE your sales with Graton & Knight Standardized Leather Fan Belts!

They are better belts. Easier to sell. More satisfactory to your customers. More profitable to you.

Graton & Knight Standardized Leather Flat Fan Belts are, by actual test, 40% more efficient than substitute belts. They hold their shape and resist motor heat, oil and water. They are sturdy belts for long service.

The Link "V" type has the unstretching strength of tempered steel and vulcanized fibre links. Traction surface of Graton & Knight standardized leather. It runs slightly slack, which saves bearings. Unusually flexible, giving firm grip on small pulleys. Easily made endless with a screw-driver.

You do not have to "cut prices" on Graton & Knight belts. They sell readily at a good profit. Write your jobber to-day for prices and particulars.

THE GRATON & KNIGHT MFG. CO.
Worcester, Mass.



GRATON & KNIGHT
Standardized
LEATHER BELTING



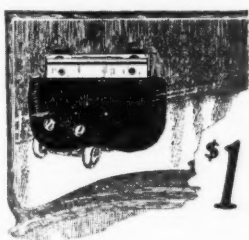
"Neva-Lost"

Hinged-Lid Cap \$1⁵⁰ for Gas Tanks

No. 12 size \$1.75

Screws on PERMANENTLY. Quarter-turn locks and unlocks hinged lid. Ground-cork gasket makes lid TIGHT. Heavily nicked. Individual cartons. Assortment of 15 covers 70 makes of cars. Counter display furnished with assortment.

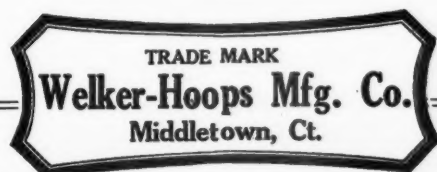
"Glare-Stop" Shield \$1.00



Just press it against windshield—and how it does stick. Rubber suction pads. Aluminum frame. Green visor of genuine "Viscoloid". SPRING holds it at any angle. Makes night driving safe. Sells on sight. Retails for \$1.00.

Welco

accessories



He took a dealer's order for
Las-Stik every day.

The World's Fastest Selling Tube Patch

That Mr. Wolever, selling for a Greenville, Ohio, jobber should have taken an order for Las-Stik every day in March is not surprising.

It is the fastest selling patch for the jobber because it is the **fastest selling** patch for the dealer.

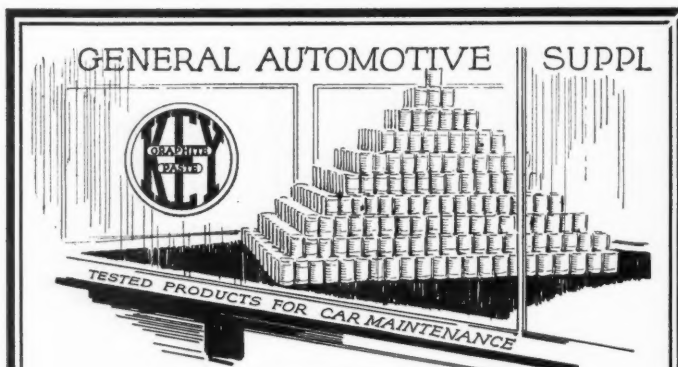
Any dealer not satisfied with the volume and rapid turnover on tube patch should write us at once and mention his jobber's name.

Sell the patch you can sell the "most of". That's bad grammar but good business.

LAS-STIK PATCH MFG. CO.
Hamilton, Ohio

Las-Stik

TUBE PATCH



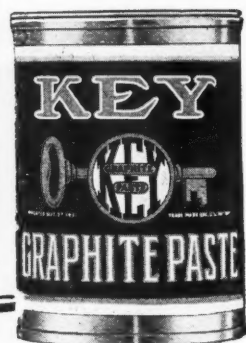
Add This Staple A Steady Flow of Business for Jobbers, Distributors, Etc.

Key Paste is a product with years of service to recommend it. It was used for a decade in other mechanical fields before it was merchandised in the automotive field. It is now generally known as a product of great merit for many uses about an automobile.

We are completing our distributing organization and invite correspondence with Jobbers and Distributors who seek a reliable product with extensive sales possibilities.

KEY PASTE IS USED ON:

GASKET SEALING, BATTERY TERMINALS, SPRINGS, MANIFOLD, SPARK - PLUG THREADS, HOSE CONNECTIONS, DOOR SQUEAKS, STEERING KNUCKLES, ALL SCREW THREADS.



PREVENTS RUST
STOPS LEAKS
STOPS SQUEAKS
LUBRICATES

**KEY BOILER
EQUIPMENT CO.**

27th & McCasland Ave.,
East St. Louis, Illinois

CLIP—

Key Boiler Equipment Co., East St. Louis, Ill.
27th and McCasland Ave.,
Please send me without charge or obligation a sample of Key
Graphite Paste.

Name _____

Firm _____

Address _____

Jobber's Name _____

**Sample
FREE**

GF Allsteel
The Complete Line of Office Equipment

Steel Shelving

Strength—Modern steel construction combines strength with light weight.

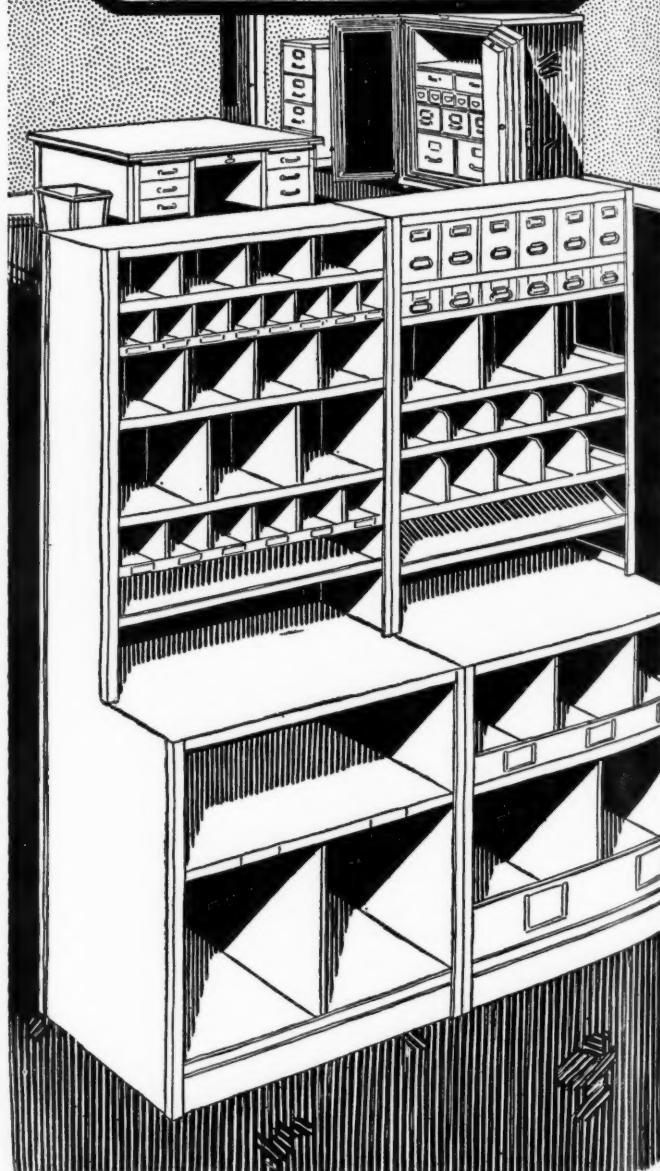
Durability—Fire-resistive—oil, water and wear proof.

Simplicity—Installed or rearranged easily and quickly, with ordinary tools.

Adaptability—Arranged to store any commodity.

Economical—10% to 30% greater storage capacity. Moved or altered without depreciation.

Shelving, Files, Desks, Transfer Cases, Safes,
Counter-heights, Sectional Cases, Accessories and Supplies
THE GENERAL FIREPROOFING CO.
Youngstown, O. Dealers Everywhere





**Greatest Improvement
in Piston Rings in
20 Years**

Sure Cure for Oil Pumping— Loss of Compression— Piston Slap

Simplex is made .010 in. oversize in width, and the staggered slots allow it to be compressed SIDEWAYS to enter the ring groove.

Stops oil pumping instantly, even in most extreme cases, regardless of WEAR in grooves. Restores original compression in worst tapered or out-of-round cylinders. Stops piston slap permanently, regardless of excessive clearance.

And correct LUBRICATION is possible THROUGH THE SLOTS.

Biggest piston ring improvement in twenty years. Profit for the car owner. Saves him the cost of a regrinding job. Profit for the garage-man. Makes a quick job without "come-backs". Profit for the dealer. He gets the full discount.

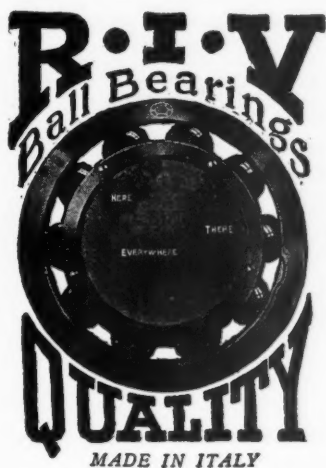
Dealers Wanted for exclusive territory. Ours is the piston ring proposition of the year. No doubt about it. Write us immediately.

The Solenberger Piston Ring Co.
1966 East 66th St., Cleveland, Ohio

SIMPLEX

PACKING RINGS

for Pistons



Broadway at 57th Street
New York City

Branches:
Chicago, Detroit, San Francisco

Live—and Let Live

We have just completed the most prosperous six months' service business in the history of R. I. V. ball bearings.

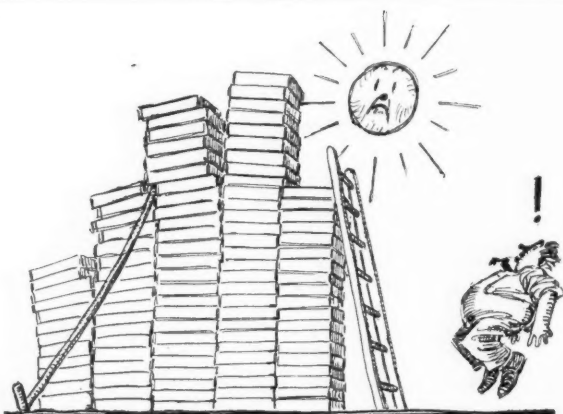
Almost every distributor has given us a larger business than in any previous six months of his connection with us.

Each month has also been larger than the same month last year, or any other year.

All of which proves that when competition is keenest, and people buy most cautiously, the bearing of highest quality, competitively priced, will unfailingly get the business.

And the famous R. I. V. policy of "live-and-let-live" shows its worth to our distributors in a permanent and constantly increasing net profit.

The Central West still holds opportunities for live R. I. V. distributors. Your inquiry will receive immediate attention.

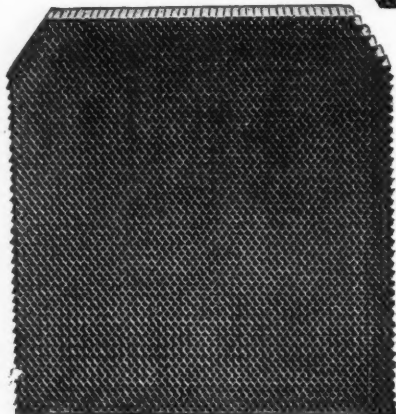
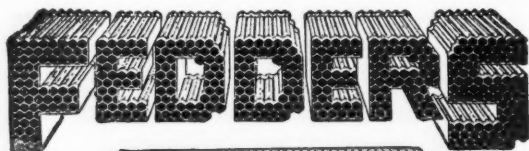


No "Sky-High" Stocking Necessary!

To Build a Profitable Radiator Replacement Business

With Fedders Cores and Fedders Service there is no easier (nor more profitable) replacement line than radiator cores for you to handle.

Fedders Cores, being shallower, are lighter, stronger and easier to handle and install than other replacement cores. Due to the design which permits larger water passages, which are virtually clog-proof, and more efficient air circulation, the danger of freezing is practically eliminated and better cooling provided.



Shallow Cores

Fedders Service makes "sky-high" stocking unnecessary—just carry a few popular types and order the rest as needed. Our conveniently located branches giving 24 hour service makes this possible.

A business opportunity requiring but little "tied up" capital and paying worthwhile profits! Write for full details.

FEDDERS MFG. CO.

Buffalo, N. Y.

Branches in Cleveland, Detroit, Indianapolis, New York, San Francisco

Let Lamps Boost Summer Business for You

For years the standby of dealers in Summer has been the K-D Line of Auto Lamps. Designed for practically every make of car; built to give satisfaction; priced to allow you a comfortable profit—K-D Lamps are in a class by themselves.

Why not "get in" on this profitable line—it's America's best line for dealers who want to make money.

THE K-D LAMP COMPANY
Cincinnati, O.

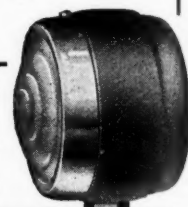
Model No. 17 Drum Type Side Lamp

For Closed Cars

Harmonizes with drum type Head Lamps. Special hollow bracket, through which wires pass, with plate which is fastened to frame of car with two screws.

Body in one piece from suitable gauge metal, all plated parts are made from brass, highly polished and plated. will not rust or corrode.

Bulbs are 2 c.p., 6-8 volt, single circuit wiring system only. Finished in either all nickel or black enamel, baked on, with nickel trimmings.



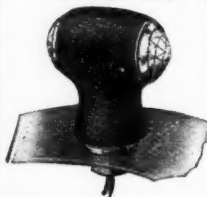
Drum Type Side Lamp Model No. 18

Model No. 28 Parking Lamp

Body made in one piece from aluminum casting, top easily removed for replacing bulb.

Glasses are cut jewel type, crystal in front, ruby in rear. Separate switch on instrument board. Lamp is fastened underneath fender with nut and lock washer.

Single circuit wiring system only. Finished in either all nickel or black and nickel.



Harmonizes with drum type Head Lamps. Two angle washers for slanting cowl. Also, for straight cowl. Body in one piece from suitable gauge metal, all plated parts are made from brass, highly polished and plated, will not rust or corrode. Bulbs are 2 c.p., 6-8 volt, single circuit wiring system only. Finished in either all nickel or black enamel, baked on, with nickel trimmings.

To the Employment Manager

You want a man who will make good—someone whose record, past and present, is evidence that he is ambitious, competent, efficient, progressive and up-to-the-minute.

He will naturally be a reader of his business paper, as otherwise he cannot fill all of the above requirements.

Broadcaster Service

can help you to locate a number of good men and from those you should be able to select just the one best fitted for your needs.

Six cents a word is all it costs for an undisplayed advertisement—but if you are in need of a man that is hard to locate a larger advertisement would doubtless prove a profitable investment.

**6¢
a word**

Use your business paper
to get business men

Comfort's Triplicate REPAIR ORDER

Form 100

Comprises an invoice, office copy, mechanics' instructions, time ticket and parts requisition—all in one!

500 Sets—\$10.20
1000 Sets—\$14.80
2500 Sets—\$34.40
5000 Sets—\$61.20

Special offer on lots of 5000

5000 Repair Orders
with name printed on 1st and 2d copy
\$66.20

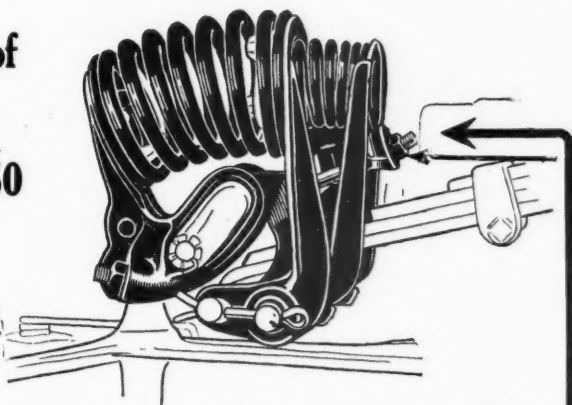
5000 Repair Orders
name printed on all three copies numbered
\$71.20

Send Your Letterhead if Name and
Address is to be Imprinted

Prices Delivered
Your City

Comfort Printing Specialty Company
101 N. EIGHTH ST. ST. LOUIS, MO.

Set of
4
\$13.50



SAVIDGE
SHOCK ABSORBER
for FORD Cars

Do not change any part
of the car.

Easily attached.

Perches are not reversed
or removed.

Springs remain as before.
Eliminates sidesway.

Real ABSORBERS of all
shocks.

Adjust the Nut To Suit the Car

This adjustment is an exclusive
feature of SAVIDGE Absorb-
ers and is a mighty big selling
advantage.

Shock Absorbers should be ad-
justed to suit the peculiarities
of each individual Ford.

THIS NUT—easy to get at—
and positive in its action—gives
the car owner just what he
wants in riding comfort.

DEALERS are urged to write for our
attractive deal.

The Savidge Shock Absorber Co.

1310 South Walnut St.

Muncie, Ind.

Kennedy's Deferred Payment Tables

100 Pages—5"x9"

**Fast Becoming the Salesman's Standard
Reference**

KENNEDY'S DEFERRED PAYMENT TABLES follow throughout the standard Time Selling Charts of the various financing companies, and contain the 25%, 33 1/3%, 40%, 50% and Farmers' Plan—giving the time selling price, initial payment, balance due, and monthly payments of six, eight, ten and twelve installments.

KENNEDY'S DEFERRED PAYMENT TABLES are computed from \$1 to \$1000, and are now being used by salesmen for all makes of cars priced under \$1000.

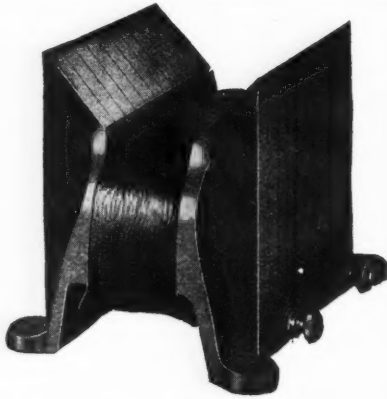
Give your salesmen the advantage of the accurate information their prospects first demand.

"More useful to a salesman than interest tables to a banker."

Price \$1.00 per Copy, Postpaid.

(Copyrighted)

KENNEDY & COMPANY
P. O. Box 2081, Clearwater, Fla.



This Growler Costs But \$6.50

With it you can tell in ten seconds whether an armature is in good condition. If it is not, you are saved all the grief of having to do the whole job over, losing all your profit and the customers' goodwill besides. Operates on 110 Volt A. C. Current.

Sold direct or through your jobber. Your check for above amounts plus twenty-five cents postage brings this moneymaker to you.

ARMATURES: We rewind any and all kinds of GENERATOR, MOTOR and MAGNETO armatures, and reship same day old armatures received.

FORD GENERATOR AND MOTOR ARMATURES.....	\$ 1.50
ALL SMALL DOUBLE UNIT GENERATOR AND MOTOR ARMATURES	5.00
SINGLE UNIT MOTOR GENERATOR ARMATURES.....	10.00
MAGNETO ARMATURES	\$3.75 to \$4.75

Armature Rewinding Co., Inc.

3301 Washington Blvd., St. Louis, Mo. (1)

SHADES

in stock for
HUDSON and ESSEX
COACHES, FORD TUDOR,
MAXWELL CLUB SEDAN,
and HUPMOBILE CLUB
SEDAN

Make shades regular equipment on the car you sell. The added appearance and comfort will be a selling asset.

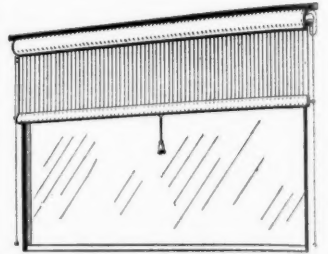
We make shades in colors to harmonize with the upholstery. Simply give the name, model, year of car and the exact glass measurements.

We use a fine quality of curtain silk, hemmed with two rows of stitching both sides. Shades are mounted on all-metal rollers

complete with nickel plate brackets, cord and fasteners. Also made in a washable fabric that can be cleaned with soap and water.

Write today for discounts and samples.

CHAS. W. RICE & CO.
319 East Third St. Uhrichsville, Ohio



See the Broadcaster Department

Page 117

The Largest and Oldest Automobile Appraisal Bureau in America



GOOD BUSINESS MEN

In addition to having the agency for a fine and popular car you have to know used car values for all cars—if you are to stay in business.

In the huge used car markets of our big cities the shrewd traders invariably use the General Used Car Market Report Service. Most of the big and progressive dealers are members of the Bureau. They know they cannot afford to guess—they have to know.

A national institution with absolutely complete information on the ever-changing used car market. The Used Car Bureau is entirely supported by its members. All Authorized Dealers are eligible to membership.

**General Used Car
Bureau**
General Motors Building
Detroit

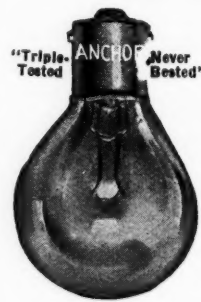
Without
Obligation
Send me
information
about the Bureau

NAME
ADDRESS
CITY

FIND OUT ABOUT MEMBERSHIP IN THE BUREAU

OUT WHERE THE RUTS BEGIN

Anchor Auto Bulbs Find the Smooth Stretches



Ordinary lamps will serve on brilliantly lighted boulevards, but it takes a quality bulb to point the safe way along a bad stretch of road.

To know that your headlights, with their seemingly fragile filament will take more bumping than a piece of cast iron is an assuring feat when you need light badly.

ANCHOR AUTO BULBS

"Triple-Tested Never-Bested"

are especially watched to see that the filament has no weak spots. Each bulb gets its bumps before it is permitted to be stamped with the Anchor mark of merit. And this quality lamp—willing to meet all corners on that basis—strange to say costs less than mediocre lamps.

Purchased everywhere for all cars.

Anchor Electric Company, 555 W. Jackson Blvd., Chicago, Ill.
Originators of "Same Day Service" in the Auto Bulb Industry

USE A STORM HONE

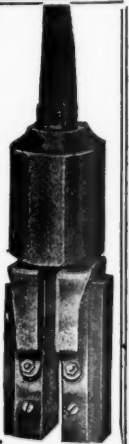
It handles an important part of your cylinder work. Takes all sizes of cylinders from 2 3/4 to 8". The deep, heavy, wide faced stones on the Storm Hone mean longer life, faster cutting and smoother finishing as well as freedom from chatter and stone breakage. Complete and with extra equipment only \$40.25.

Write for the Storm Book,
"Modern Cylinder Methods"

STORM Mfg. Co.

406 A Sixth Ave. So.
Minneapolis

Minn.





**60,000
Sold
in six months**

MINUTE METER \$2.50

The Lux Clock Mfg. Co., Waterbury, Conn., U.S.A.

The Cash Register is the Alarm and it r-r-rings very often!

Sales on this low-priced, dependable automobile clock keep the cash-register ringing—Proof? 60,000 Minute Meters Sold in six months, the first six months of its existence!

And the Minute-Meter Stays Sold—its ability to tick the minutes off "to the minute" day in and day out is the reason. Convenient, too, a turn of the knob, shown in illustration and the Minute Meter lifts out for rewinding or setting. A handsome reliable little instrument with a display stand that shows it off to advantage.

The Minute Meter fits flush on any dash of any thickness, wood or steel. Neatly packed in individual cartons. Attractive display stand as shown above with each dozen! Orders shipped promptly!




Minute Meter Dash Cutter

Added Profit in Installation

Add 50 cents to the price for installation! With the Dash Cutter the Minute Meter can be put on a wood back instrument board in about 15 minutes—10 minutes for all-steel boards! Complete, ready for use, \$1.00. Two installations and the cutter is paid for.

The LUX CLOCK MANUFACTURING CO., INC.
Waterbury - Connecticut - U.S.A.

A REAL SHOP TOOL



Narrow valve seats give greater engine power and pep and customers pay well for the "punch" they want.


Counterbore valve seats with a LiPe Adjustable Valve Seat Counterborer. Cuts circles 1 3/8" to 2 3/8". Can't chatter.

Pays for itself in a few jobs and lasts indefinitely. Add one to your kit and get extra profits.

\$10 that's all

and the price includes 3 pilot rods.

Ask your Jobber's Salesman or send order to us with your Jobber's name.



LIPE Adjustable Valve Seat COUNTER BORER

R. N. ROACH COMPANY
RIALTO BLDG. SAN FRANCISCO, CAL.



**In Cleveland-
it's THE
HOLLENDEN
HOTEL**

Add 30% to 300% Profit on Your Ford Repairs

This new 88-page Book pictures and describes the latest methods of speeding Ford work, demonstrated successfully at Ford clinics all over the country. Sent free only to mechanics and shop owners. Be sure to attach your card or letterhead to coupon.



Stevens & Co.
375 Broadway, New York

Mail this Coupon

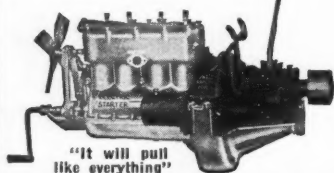
Stevens & Co., 375 Broadway, New York
Please send your 88-page Book No. 18 on Ford and Fordson repair work.

Dealer.....
Address.....
City..... State.....

MORE POWER

For Ford Cars and Trucks

26 to 1 in low in our new type "CT"



"It will pull like everything"

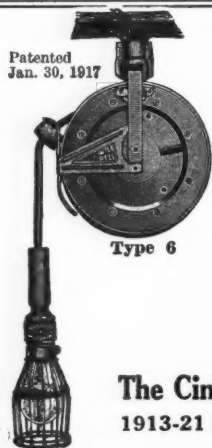
clutch. Foot brake on jackshaft outside of case. Hyatt Roller and Genelite bearings. No cutting or machining—installation easy.

E. D. & A. F. CRONK, Inc., 140 Hotel St., Utica, N. Y.

Replaces the regular Ford **Transmission**
SIMPLEX 3 SPEED Sliding Gear Type

Have three speeds forward and one reverse, replacing the regular Ford transmission—drums, bands and all. The low speed is lower than the Ford, therefore, more power—the third is the same as the Ford and the second is half way between.

It's ruggedly built with oversize alloy steel gears. Multiple disc



Patented Jan. 30, 1917

Type 6

Autex Extension Reel

Takes light where wanted. Cord locked at any desired point and rewound automatically on reel when not in use. Used in all places where extension of either light or power is required, eliminating the inconvenience and danger of loose cord extensions.

Approved by Underwriters

The Cincinnati Specialty Mfg. Co., Inc.,
1913-21 Powers St., Cincinnati, Ohio**The "Anti-Dry" Leader!**

The Tasco Gauge! leader in the fight against dry gas tanks! Prospective voters? EVERY Ford and Chevrolet owner in the country!

A well constructed gauge with all working parts enclosed—will last indefinitely. Replaces old gas tank cap. A big seller at the pump! in the window! over the counter!

The Akron-Selle Co., Akron, Ohio
"40 Years in Business"**TASCO GAS GAUGES**
Ford and Chevrolet**\$1.25**
Retail Price**NEVER-LEAK**
Cylinder Head Gaskets

Insure Satisfactory Engine Performance

They're "Bound to Be Good"

FITZGERALD MANUFACTURING CO.

TORRINGTON, CONN.



Postage Paid

Automobile Selling Sense

225 Pages of Automobile Selling Ideas

The best book on automobile selling ever written. It covers every phase of motor car merchandising. Twenty interesting and practical chapters. Order your copy today. Take advantage of the assistance it will be to you.

SALES EQUIPMENT COMPANY411 Kerr Bldg., Detroit, Mich.
Send for our Catalog of Selling Equipment.**BUTLER SPRINGS AND THE ACE OF CLUBS ALWAYS WIN**

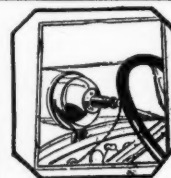
Butler Springs are made of very fine grade steel. They are carefully heat treated and tested for hardness and strength.

Order your Ace of Springs today.

BUTLER AUTOMOTIVE SERVICE CO.
101 D ST. EASTON, PA.**WAYNE**
CYLINDER REBORING MACHINE & VALVE GRINDER

Be equipped with these two efficient machines to render good service on cylinder reboring and valve grinding jobs. Save time and labor and get more profit.

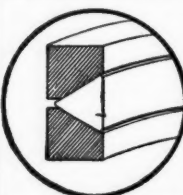
Write for details.

WAYNE TOOL MFG. CO., WAYNESBORO, PA.

Patented Oct. 30, 1923

INSHIELD DRIVING LIGHTS

INSIDE THE WINDSHIELD—NO GLASS TO CUT

INSHIELD 8 4 1/2 in. diameter. Heavy Nickel or Black Enamel. Made of heavy sheet brass. 21 c. p. Mazda precision type tipless bulb, silver, triple-plated reflector \$7.50
INSHIELD SENIOR 5 1/2 in. diameter. Nickel finish only. Simplest and best inner-controlled driving light made. \$10.00**The Inshield Products Co., Toledo, Ohio**
Formerly the Thal & Bitter Machine Co.Wedge-Rite piston rings are 3-piece rings following the best engineering practice. The patented wedge takes up the wear, keeping the groove and cylinder wall tight against oil and compression leakage. Wedge-Rite Piston Rings are made from the best individual castings.
WedgeRite - - - - Plattsburgh, N. Y.

Threaded for 3/4-in. hose. Strongly supported and counter balanced. All brass construction.

Electric contact by rotor brush. Watertight joints — automatic water control at end of hose.

9 ft. swivel permits use of short hose. Light always OVER job. Water controlled AUTOMATICALLY by LITTLE GIANT WATER SAVER. Lowest priced combination washer and water saver. Write: **THE GAYLORD MFG. CO., Paterson, N. J.**

Let us send you our FREE Catalogue on

Huetter's
Fly-Wheel GearBands**Huetter Machine & Tool Co.**

546 Kentucky Ave.

Indianapolis, Ind.

Kawneer
SOLID COPPER
STORE FRONTS

Write for Special Book Garage Fronts

THE KAWNEER CO., 1219 Front St., Niles, Mich.

Jack—For Balloon Tires



Patent
Applied
For

The Springfield Jack No. 9 especially designed for balloon tires—

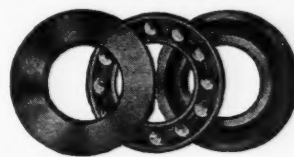
Double Screw—Ball Bearing Low Placement—High Lift Height when closed, 7 inches Extends to 17 inches.

Convenient handle excellent workmanship and quality.

Dealers—Jobbers—Write us for discounts

THE SHAWVER CO.
Springfield, Ohio

Weight 8 pounds
Capacity 1 ton
Price \$4.75



The Bearings Company of America, manufacturers of STAR Ball Retainers, for Thrust, Magneto and Cup and Cone types of Bearings. Complete Thrust Ball Bearings, Angular Contact Thrust Bearings and Angular Contact Radial Bearings (made to your B/P's and requirements).

THE BEARINGS COMPANY OF AMERICA
LANCASTER, PA.

Detroit Office,
1012 Ford Bldg.

Get a Manley



Portable Floor Crane

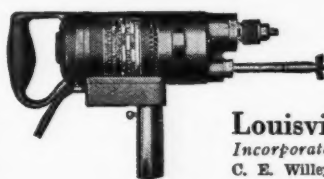
The Manley Portable Floor Crane possesses all the essentials of a crane for the best and most economical automobile repair work. It has high lift, deep overhang, ample lifting capacity and great strength.

And, at the same time, due to revolutionary design, the Manley Crane has the greatest lightness in weight.

Write for the complete catalog of Manley Equipment

THE MANLEY MANUFACTURING CO.
YORK, PA.

Get This "Pioneer" \$65 Garage Special



Electric Drill and Valve Grinder

Greatest time and money saver, as well as money maker, for your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.
Incorporated Louisville, Ky., U. S. A.
C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

"BETTER BOOKKEEPING AT LESS COST"

FREE

A booklet describing a practical and economical solution of the BOOKKEEPING PROBLEM

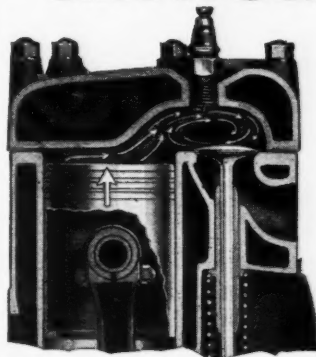
for

GARAGE and AUTOMOBILE TRADE

Write **TODAY** for your copy.

THE BUSINESS METHODS CORPORATION
617-M Security Bldg. Springfield, Mass.

The Ricardo Head



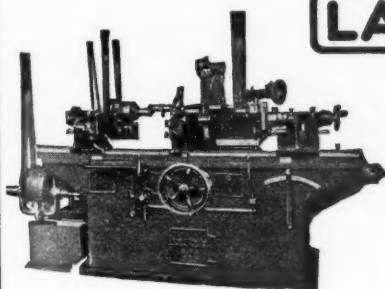
Even though casual inspection of the Ricardo Head discloses evidence of wide improvement over conventional types of combustion chamber design, nothing is quite as conclusive, quite so determining as Ricardo Ell Head Engine behavior in service.

There performance is a definite thing. There its economies can be appraised and compared.

WAUKESHA

Motor Company
ENGINE BUILDERS
Waukesha, Wisconsin
New York, N. Y.

LANDIS



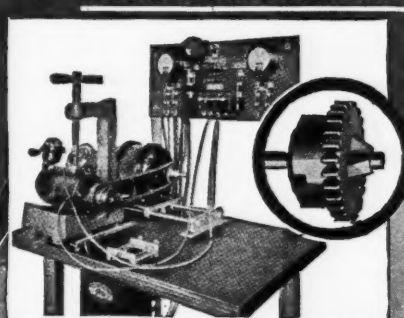
The LANDIS 4-A Special GARAGE Grinding Machine is built ESPECIALLY for repair shop work. You don't need a manufacturing machine—don't get one. The 4-A Special is perfect for repair shops. Quick and easy change from job to job. Simple to operate. ACCURATE. Built by world's largest makers of grinding machines. More value for your money. Catalog.

Landis Tool Co., Waynesboro, Pa.

New York Office—30 Church St.

EXCELSIOR TEST BENCH

With the Positive Drive and Speed Control



INCREASE YOUR PROFITS!

Starting, lighting and ignition pays bigger profits than any other branch of automotive service.


The Excelsior Test Bench

equips your shop complete for this work.

Price \$385.00

Payable \$50 per month
Write for bulletin 975M

WEIDENHOFF 4350 ROOSEVELT ROAD
CHICAGO, ILL., U. S. A.



Bosch

There is a Robert Bosch Selling Franchise that covers your requirements. Write us. Robert Bosch Magneto Co., Inc. The Genuine, Original Bosch. Otto Heins, Pres., 109 West 64th St., New York

The new Columbia selling agreement incorporates those features interesting to successful dealers. You are invited to investigate.

COLUMBIA MOTORS CO.
Address Dept. "B" Detroit, Mich.

ZENITH More Power
CARBURETOR Less Fuel

Zenith - Detroit Corporation, Detroit, Mich.

JOHNSON Gas Appliances
Metal-Melting Soldering Heat-Treating


JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

Pacific Coast Repr., C. B. Babcock Co., San Francisco, Calif.
New York Office—277 Lafayette St.

THE QUINCY SILENT AIR-MASTER

The Most Air Per Dollar Cost

WALL PUMP & COMPRESSOR CO.
Quincy, Ill., U. S. A.



140 Combinations
—all in this ONE set

Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.

The Eastern Machine Screw Corp.
10-20 Barclay Street, New Haven, Conn.

Do Motor Re-conditioning and Earn Big Money!

You can ream and hone an average cylinder block the factory way in fifty minutes. Do the work without removing the engine, quickly, efficiently and economically.

All you need is
FOSTER-JOHNSON
Cylinder Reamers and Hones

Write for Foster-Johnson Station Manual and Tool Catalog

Foster-Johnson Reamer Co.
1304 Beardsley Ave., Elkhart, Ind.


Now offering both the matchless Peerless Eight and the Superb Peerless Six

PEERLESS

QUALITY—PROFIT—TURNOVER

American Hammered Piston Rings

American Hammered Piston Ring Company
Baltimore, Maryland



LINENDOLL EXHAUST HEATER

Attractive in appearance, with cleaning features of removable heating coil with no connecting joints inside the heater pan to leak. Meets instant approval. No odor or noise. Easily installed and operated. Will boost your winter sales—get our attractive trade proposition.

THE NORWALK AUTO PARTS CO.
Norwalk, Ohio

\$2.00 Retail East of Rockies

Life Timer for Fords

Needs no oil. Short proof. Fool proof. Wipes a perfect contact regardless of wobble in the shaft. Bakelite Commutator is reversible, giving 2 timers for the price of one. Sold through the jobber. Write for folder and discounts.

Mechanical Production Co.
MILWAUKEE, WIS., U. S. A.

ECLIPSE Safety SHADE

Instantly adjusted to any desired shading position with one hand from driver's seat. Makes night driving safe. One size for all cars. Write at once for our plan of distribution and full details.

SUBURBAN TRANSIT CO., Plainfield, N. J.
Subsidiary of Spicer Mfg. Co.

NO-LEAK-O PISTON RINGS
Won't Leak Because They're Sealed With Oil

No-Leak-O Piston Rings are making money for dealers everywhere. Their "oilSEALING" groove—found only in No-Leak-O—packs an oil film in between piston and cylinder walls like "packing" in a pump. Oil and gas stay where they belong. National advertising is helping the dealer sell No-Leak-O. It will pay you to stock No-Leak-O at once.

Price 35c and up

NO-LEAK-O PISTON RING CO., Dept. 376, Muskegon, Mich.

See Page 117

RESTER Acid-Core WIRE SOLDER

"REQUIRES ONLY HEAT"



SAMPLE FREE

CHICAGO SOLDER CO. 201 Wroughtwood Ave.

"In Stock - Not Over a Day Away"

Write Milwaukee Die Casting Co., Milwaukee, Wis., for name of one of our 500 distributors nearest you.

MILWAUKEE BEARINGS

Chaneeze**Chain Tightener****The New Design helps it to Sell**

The improved design of the Chaneeze Anti-Skid Chain Tightener, besides tightening chain, preventing slap and rattle—helps the chain to creep, thereby saving wear on tires to a noticeable extent and providing a strong sales feature. Retail price \$1.00 pair. Individually boxed, liberally discounted. Jobbers—Dealers—Write.

ELECTRIC PARTS CORP.
318 E. Genesee St. Syracuse, N. Y.

WEL-EVER**"OIL CONTROL" PISTON RINGS**

The Motor Necessity That Has Made Good
Backed by Seven Years' Satisfactory Service

THE WEL-EVER PISTON RING CO., TOLEDO, OHIO
Sold most everywhere. If your dealer cannot supply you write us.

We Make RADIATOR CORE EQUIPMENT

For the Complete Manufacture of
RADIATOR CORES

Ask Us About This Equipment
We make the best radiator test plug.

RADIATOR ENGINEERING CO.

626 Nesselwood Ave.

Toledo, Ohio

Isolators
Lock
Plates.
An
Exclusive
Vesta
Feature

**THE ONLY ONE**

A selling feature—and a very essential feature, too, are VESTA BATTERY ISOLATORS—a mark of merit in Vesta Batteries for the past 8 years. Write for literature.

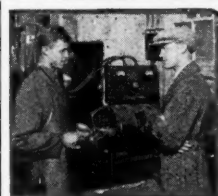
Vesta Battery Corporation
Chicago, Ill.

**UNIVERSAL HOSE CLAMP**

Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

UNIVERSAL INDUSTRIAL CORP.

Hackensack, N. J.

**\$20 Monthly Brings You Big BATTERY CHARGING PROFITS**

Small cash payment brings you HB 8-hour charging outfit. Easy terms of only \$20 monthly, let your profits pay balance with nice surplus besides. Thirty-day free trial on money-back guarantee lets you try HB outfit at our risk. Ideal outfit for overnight charging. Start now to make \$150 to \$300 Monthly with HB 8-hour battery charger. Write today for information.

HOBART BROS. CO., Box AR 924, Troy, Ohio

**ATTENTION—CAR DEALERS EQUIP YOUR CARS WITH "DIMIT"**

Dims the lights with a touch of the toe. A remarkable seller. \$1.50. Large discounts in quantities. For all cars.

Distributors Wanted

THE DIMIT CO.

317-19-21-23 Fallsview

Baltimore, Md.

BATTERY SERVICE EQUIPMENT!

UNITRON Rectifier

PORTOSTAT Test Set

FOREST ELECTRIC COMPANY

New and Wilsey Streets

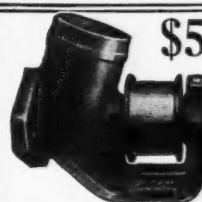
NEWARK, N. J.

\$17.50 COLONIAL CYLINDER HONES \$17.50 PRICES REDUCED ONE HALF

You can now buy the Colonial Cylinder Hone, an approved tool for this class of work and one of the best Hones on the market at \$17.50 each F. O. B. Kalamazoo. Made in three sizes, one, two and three, No. 1 2 3/4" to 3 3/4", No. 2 3 3/4" to 3 3/4" bore, No. 3 3 3/4" to 4 3/4".

Colonial Cylinder Hones are now being used by some of the best factory Service Stations in the country as well as by numerous Service Station Owners.

Colonial Gear & Manufacturing Co., Kalamazoo, Mich.



\$5

Wood-Imes

Water Circulating Pump
For Ford Cars and Trucks

Is as reliable as the Ford Car itself and assures a positive cooling system that constantly functions. No more overheating—No more freezing in travel—Made engineeringly correct of best materials—quickly and easily installed. Write for Dealer Discounts and complete information.

WOOD-IMES MFG. CO., MINNEAPOLIS, MINN.
Formerly Mid-West Mfg. Co.

"CONNEAUT" Plastic Metallic Packing

Patented

Stops the leaks in automobile water pumps. Mold it with your fingers. Makes a smooth metal bearing—adjustable and practically frictionless. At your Jobbers—Get it today. It does the trick. Put up in 1 lb. cans. If your Jobber doesn't carry it, write us direct. Price \$1.65 per pound, f. o. b. Conneaut, Ohio.

The Conneaut Packing Company

Conneaut, Ohio

**The 100% Lubricants**

Guaranteed not to cake or harden or to contain any Moisture, Mineral or Fatty Acids. Attractive proposition for Jobbers and Dealers.

RADIANT OIL CO., Inc.
Manufacturers and Compounders

Lima

Ohio

Write for Free
Catalog No. 31

Styles For All Cars

Gemco BUMPERS

Special Process Tempered
Greater Cushioning Resiliency

GEMCO MFG. CO.
742 So. Pierce St. Milwaukee, Wis.

DILL INSTANT-ONS

Dust and Valve Cap

Off or On in 5 Seconds

The Dill Manufacturing Co.

Cleveland, O.



DOUBLE YOUR FORD SELLING FIELD
And Make Two Profits with

Warford

AUXILIARY TRANSMISSION

Two-Ton Capacity—High Speed

Ask your nearest distributor to demonstrate it or write us.

THE WARFORD CORP., 44 Whitehall Street, New York

Thirty-seven BRANCHES
AHLBERG BEARING COMPANY
321 EAST TWENTY NINTH STREET, CHICAGO ILLINOIS

"Best Money Maker I Ever Handled"
Says One of our Distributors
And his sales prove it! The reason is that the Duplex Tire Carrier & Rim Tool is one of the most popular items of equipment introduced in recent years.

DUPLEX Second Spare Tire Carrier
And Rim Tool
Two tools for the price of one. Holds tires securely. Expands and contracts rims. Attached instantly. Write for details.

TRIPP-SECORD & CO.
606 Kerr Bldg. Detroit, Mich.



"It pays to buy a Kellogg"

KELLOGG

COMPRESSORS

ROCHESTER, NEW YORK

CABLES of Quality

The Packard Standard since the beginning of the industry.

Electric Company WARREN, OHIO

"Turn Miles Into Smiles"
with *Stewart* SHOCK ABSORBERS
\$30 per set of four (\$1.00 increase in west)

INSIST UPON THE RED TAG



Master Spit Fire
The oldest standard plug
Actually Spit Fire while others spark only.

ENERGETIC IGNITION—GREATER POWER

MOSLER METAL PRODUCTS CORP.
P. O. Box 292, Mt. Vernon, N. Y.
Manufacture "Spit Fire" Red Top and Timers

Racing FORDS

Write today for pamphlets and LOW PRICES covering Power-Plus Cylinder Head. Aluminite Racing Pistons and Connecting-Rods, High-Speed Camshafts. Rebuilding ALL MAKES of cars for racing a specialty. Nine years' experience.

GREEN ENGINEERING CO., Dayton, O.

REPUBLIC

Yellow Chassis **TRUCKS**

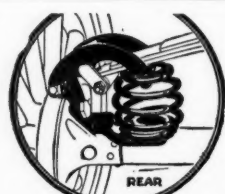
REPUBLIC MOTOR TRUCK CO., INC., Alma, Michigan

Lorentzen Headlight Kontrol
AN AUTOMOTIVE NECESSITY THAT SELLS
LORENTZEN HEADLIGHT KONTROL, INC.
60 Grand St. New York City.



FORDS \$12.50

Per Set
Guarantee Bond with Each Set
Salesmen, Distributors and Dealers, Write Us
Monarch Shock Absorber Co.
Muncie, Ind.



PARAFLECTOR

At last—a headlight reflector that makes night driving safe.
Write for full details.
The PARAFLECTOR CO., Minneapolis

LaRose Air Stabilizer

All the sales features of an air cleaner plus the advantages of a humidifier. Moistens air by washing it, providing

Complete Combustion

Resulting in greater power and speed, less gasoline consumption and no carbonization.
Jobbers—Dealers—Write.
Lasco Corporation, Niagara Falls, N. Y.




REG. U.S. PAT. OFF.

TESTBESTOS

Automobile Brake Lining
Manufactured by
AMERICAN ASBESTOS COMPANY
Norristown, Pa., U. S. A.

DON'T

Turn Down a Rewind Job
Send it to us. We are "Armature Winding Specialists."
Profit for you in our service—Ford generator armature rewind—\$1.95. Other prices in proportion. All work guaranteed. Write for catalog and prices on all generators.
H. M. FREDERICKS CO., Lock Haven, Pa.





BURD

GILMAN
SHOCK ABSORBER
The Perfect Snubbing Device with the Steel Cable
Distributors Everywhere
Burd High Compression Ring Co., Rockford, Ill.

Buick Continues Hall Endorsement

After using Hall Hones for over one year Buick test out the New Hall Hone and approve of it. It is the only Hone endorsed by Buick.

THE HALL CYLINDER HONE CO.
435 Dorr St., Toledo, Ohio



KING QUALITY
ALL THE NAME IMPLIES
STEERING KNUCKLE BOLTS AND BUSHINGS
PISTON PINS—PISTON PIN SET SCREWS
Automotive Division
KING SEWING MACHINE CO., BUFFALO, N. Y.



Bearing Blue
Enamel (Air Drying)
Enamel (Cylinder)
Fan Belts
Gasket Cement
Graphite
Leather Dressing
Metal Polish and
Nickel Polish

Rie Nie

Automotive Products

DURKEE ATWOOD CO.
CHICAGO, U.S.A.

Patch
Pedal Pads
Radiator Cement
Orange Shellac
Rubber Cement
Shellac (Gasket)
Spring Lubricant

Tire Mica and
Tire Talc

YOU can handle this body PROFITABLY

**HYMAN
PRESSED
BODIES**

THE HYMAN PRESSED BODY CO.,

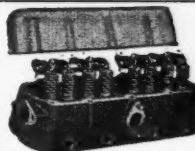
All steel construction provides lightweight with extreme strength. Outlast chassis. One design fills most light truck user's requirements. Ton and Half-ton sizes. Shipped knocked down. Low priced. Distributor and dealer terms liberal. Write.

Huntington, W. Va.

**LITTLE
WONDER**
VALVE SPRING
COMPRESSOR

The most efficient Valve Spring Compressor and Holder. Saves time and temper. Fully guaranteed. Printed matter on request. Get it! \$7.25 C. O. D.

The Little Wonder Valve Tool Co.
606 Onelda St., Joliet, Ill. P. O. Box 1028
Manufactured by Waterloo Valve Spring Compressor Co.



Frontenac
CYLINDER HEAD

PERFECT PERFORMANCE

The remarkable showing of the three Frontenacs in the 500 mile race was due solely to the Frontenac Cylinder Head. This head is adapted for use on YOUR Ford by its designer and builder, Arthur Chevrolet. Book, "How to Build a Frontenac," \$2; free with orders of \$50 or more. Write for FREE catalog.

CHEVROLET BROS. MFG. CO.
410 W. 10th St. INDIANAPOLIS, IND.

Jacobs ROAD-LITE

Lights the way to safety

Lights up the right hand side of road 60 to 70 feet ahead. Can't shine in other fellow's eyes. Invaluable for night driving.

Jacobs Auto Safety Lamp Co., Blacksburg, Va.

Have you seen the new Gilmer Fan Belt?

It's a V shaped belt, constructed of tough fabric and a new special rubber compound. Sizes for all popular cars using V or grooved pulleys. Write for prices and complete information.



L. H. Gilmer Co.
Philadelphia

"It's a Gilmer Product—you can depend on it."—Happy Van, the Gilmer man.

Gilmer

BRUNNER
AIR COMPRESSORS
FREE

Write for the Book
"AIR PROFITS"

describing many new uses for compressed air. Shows how to make an air compressor earn greater profits.

BRUNNER MFG. CO.
UTICA NEW YORK

"2-Point-Test" \$2.50
HYDROMETER

"Guards
Your
Battery's
Health"

Here at last is a battery tester of very finest quality. It is absolutely guaranteed to be accurate—every instrument must pass the two-point test. Green ribs of celluloid make sticking of float impossible. Write for details.

N & N HYDROMETER CO. 3715 W. Grand Ave., Chicago

Battery Plates

CONTINENTAL BATTERY CO.,

3201 Papin St., St. Louis, Mo.



**PERFECTION
SPRINGS**



**Meachem
Gear Rings
for Fly Wheels**

Quality rings at
lowest prices. Get
our list.

**MEACHEM GEAR
CORPORATION**
Syracuse, N. Y.



Noiseless Timing Gears

Install quietness — Cloyes NOISELESS Timing Gears. They give the motor a soft, even "purr"—permanently.

Cloyes Gear Works
1614 Collamer Ave., Cleveland, O.

Sales Representatives
United Autoware Co., Fisk Bldg., New York City
N. Lowenthal, Box 952, Ft. Worth, Texas

Over 110,000,000
TIMKEN
Tapered
ROLLER BEARINGS

Have Been Manufactured

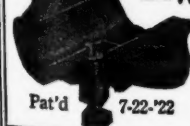
Hycoc
Brake Lining
FOLDED AND STITCHED
HYDRAULIC COMPRESSED

Millions of feet
annually installed
as factory equipment

**THE MANHATTAN
RUBBER MFG. CO.**
PASSAIC, N. J.

TAKE THE END-PLAY OUT!

—WITHOUT PULLING THE MOTOR



Pat'd 7-22-'22

THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end play and sets magneto for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

ADJUSTABLE BEARING CO., Inc.
Dept. M. Brazil, Indiana

Biflex
for every car

Cushion
Bumper



"PROTECTION
WITH DISTINCTION"

THE BIFLEX CORPORATION, Waukegan, Ill.



Wonderful Time Saver

The C & G Wheel Puller removes wheels in a jiffy. No thread stripping. No wobbly wheels from spoke strain or sprung brake drums. The harder the pull, the tighter the grip evenly applied over whole wheel hub. Write for further information.

Sold on money back guarantee—\$12.00

Adapters—\$2.00 each

State for which car. Adapters fit from two to 15 cars.

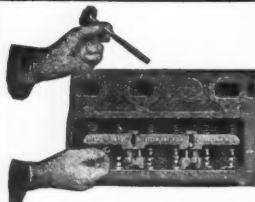
The C & G Wheel Puller Co., Wellsville, N. Y.



Spring-steel, Oil-tempered Bumpers in Six Complete Styles. Guaranteed Satisfactory Attaching Arms for all Leading Makes of Cars.

We invite comparison in appearance, quality and price.

THE BELLEVUE MANUFACTURING CO., Bellevue, Ohio



SPEED-O Multiple Valve Lifter

LIFTS 8 TO 12 VALVE SPRINGS
IN LESS THAN 30 SECONDS

Manufactured by

SPEED-O MULTIPLE VALVE LIFTER CORP.
1926 Broadway, New York



CASE MOTOR CARS

J. I. CASE T. M. COMPANY
Racine Wisconsin

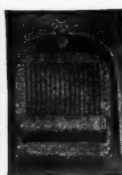


MEGSON WIPER RINGS

A sure cure for oil troubles. Prices: 2 3/4" to 4" 75c; 4 to 4 1/2" \$1.00; 4 1/2 to 5" \$1.25. Write for literature.

The Auto-Diesel Piston Ring Co., 157 Brewery St., New Haven, Conn.; Megson Wiper Ring Co., 1993 Bedford Ave., Brooklyn, N. Y.; Megson Wiper Ring Co., 4518 Superior Ave., Cleveland, Ohio; Auto Parts & Repair Co., 551 Liberty St. East, Savannah, Ga.

Round top cannot push oil up. Knife edge wipes surplus from side walls.



Radiator Cover

Fits Cars only. Best weather-proof materials. Ford size \$3. Average all other cars, \$4. Write for discounts.

Stay-Tite Tire Cover

With handy hook. Hooks easily. Can't loosen. Top material or enamel drill. As shown and Drum Type.



TYSON MFG. CO., Lock Haven, Pa.



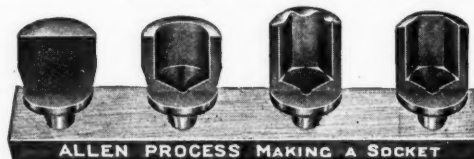
CRANK PIN
RE-TURNING
TOOL



The Auto Hone Co., Buffalo, N. Y.



Cold-Drawn
Sockets



ALLEN
Wrench
Sets

ALLEN PROCESS MAKING A SOCKET

The Allen Manufacturing Company, Hartford, Conn.



RED GIANT RIM TOOL

The name "RED GIANT" is a guarantee of satisfaction. Known and used in the majority of the civilized world. If your jobber cannot supply you write direct.

RED GIANT TOOL CORP.

Lynchburg, Va.

PYROLITE STOP SIGNALS

High in Quality—Low in Price

Get Our Plan

Steinberg Products Co.

3146 Olive St.

St. Louis, Mo.



ATWATER KENT

The World's Highest Grade
Ignition, Starting & Lighting.

4957 STENTON AVENUE

PHILADELPHIA, PA.



Kokomo Long Life tires and tubes make money for dealers who handle them.

Kokomo Twin-Grip Fabrics
Kokomo Two-Grip Cords
Kokomo Everlast Red Tubes
Kokomo Standard Gray Tubes

KOKOMO RUBBER CO., Kokomo, Indiana
131 South Main St.

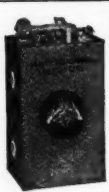


BRAKE LININGS and CLUTCH FACINGS

Always used where safety and service are the first and only consideration.

KELSO M'FG CO.,

TRENTON, N. J.



Real High Tension Ignition for Ford Cars

Varley coils eliminate nearly all chronic ignition trouble. Save gas. Add power. Keep plugs clean. Stop misfiring. Save repairs. \$2.50 each. Write for full particulars.

The Autocoil Co., Jersey City, N. J.



USE THE AMMCO

Cylinder Re-Conditioning Tool

Regrinds and refinishes cylinder bores. It is self-adjusting, self-aligning and self-centering. Write for Bulletin.

Automotive Maintenance Machinery
Company
551 W. Washington St. Chicago



Heat shaped to insure perfect roundness, sold at almost the price of a snap ring.
Wilkens Mfg. Company
15th and Mt. Vernon St., Philadelphia, Pa.

The Broadcaster

A Department that will Find What You Want

PARTS and REPAIRS

PARTS and REPAIRS

PARTS and REPAIRS

NEW

AUTO PARTS

USED

The Largest Stock of New and Used Car and Truck Parts in the World. We Have Everything. Write Us.

New Motors

Continental Red Seal 4N, 3 $\frac{3}{4}$ x5.....	\$250.00
Herschell Spillman, 4 Cyl., Model 7000, 3 $\frac{3}{4}$ x5.....	125.00
Buda, 4 Cyl., Model R, 3 $\frac{3}{4}$ x5.....	150.00
Lycoming, 4 Cyl., Type K, 3 $\frac{3}{4}$ x5....	65.00

New Clutches

Borg & Beck, Type DX, 12".....	\$18.00
Borg & Beck, Type DX, 10".....	8.00
Hoosier, 10".....	7.50

Starters, Generators and Magnetos

New and Used, for All Cars and Trucks

Universal Joints

New and Used, for All Cars and TRUCKS

Radiators

New and Used, for All Cars and Trucks

WHEELS

New and Used, Wood, Disc, Wire and Steel, for All Cars and Trucks

SPECIAL

Budd Wire Wheels, New Type, 32x4. Will Fit Oakland 34C, Paige 6-44, and Other Cars... \$8.00 Each
Set of Five \$37.50

NEW GEARS

For All Cars at 33 1-3% to 50% Discount Off List

Telephone, Telegraph or Write Your Order

Always Mention Model and Serial Number of Car or Truck
Immediate Shipment Guaranteed

SPECIAL

FORD CUSHIONS. FRONT AND REAR. TO FIT 1921-2-3

\$2.85 Each

New Carburetors

Zenith HP5A	\$15.00
Zenith O4	7.50
Zenith T4	7.50
Stromberg $\frac{3}{4}$	4.90
Stromberg LB1	12.50
Stromberg M1	9.00
Stromberg M2	11.75
Stromberg O2	14.50
Rayfield L3P	11.50
Rayfield MR3V	9.75

25% Deposit Required
With All Out of Town Orders

DOUGLAS AUTO PARTS CO., Inc.

HOUSE OF A MILLION PARTS

2003-5-7-9 So. State St.

Dept. P

Phone Calumet 7174-7175

Chicago, Ill.

PARTS and REPAIRS

NEW AND USED AUTO PARTS

We have wrecked over a thousand cars.

SANDER BROS. AUTO WRECKING CO.
WEST POINT, IOWA

INFORMATION

Six cents a word is the rate for all undisplayed advertisements set solid, regular want ad style; all capitals, 9c. a word; all capitals leaded, 12c. a word; minimum charge \$1 an insertion; payable in advance (see next paragraph).

Ten per cent discount if one payment is made in advance for four or more consecutive insertions.

PARTS and REPAIRS

DOWMETAL PISTONS

Lighter, stronger, and longer wearing than aluminum or iron. Can be fitted with bronze bushings in the wrist pin holes same as in iron pistons. Dowmetal has no permanent growth. The expansion is little more than iron.

SEND FOR PARTICULARS
LAMMERT & MANN CO.
Cylinder and Crankshaft Grinding
215-21 N. Wood St. CHICAGO Phone West 4918

JANSEN FLY WHEEL GEAR RINGS

Chevrolet 490.....	\$3.00
Chalmers	4.00

JANSEN MACHINE COMPANY
Des Moines, Iowa

AUTO PARTS

Save 50 — 90%
2000 Models
NEW AND USED GEARS, AXLES, BEARINGS, SPRINGS, MAGNETOS, GENERATORS, ETC. JOBBERS IN BANKRUPT AUTO SUPPLIES.

BRIGHTMAN AUTO EXCHANGE
321 Windsor Ave. HARTFORD, CONN.

AUTO PARTS

SAVES 50% TO 75% ON ALL CARS
New and Used Gears—Springs and Axles—Cylinders—Motors—Rear Systems, etc. Wire or Write
INDIANA AUTO PARTS CO.
316-18 NO. ILLINOIS ST. INDIANAPOLIS, IND.
LARGEST CAR WRECKERS IN INDIANA

PARTS and REPAIRS

PARTS FOR AUTOS AND TRUCKS
WHAT DO YOU NEED? We have it. Gray's Auto Parts Company. 3213 Brighton Road, Pittsburgh, Pa.

PATENTS and PATENT ATTORNEYS

Attorney-at-Law and Solicitor of Patents
C. L. PARKER

Formerly Member Examining Corps, United States Patent Office

American and foreign Patents secured. Searches made to determine patentability and validity. Patent suits conducted. Pamphlet of instruction sent upon request.
McGill Building, WASHINGTON, D. C.

PATENTS

BOOKLET FREE HIGHEST REFERENCES
PROMPTNESS ASSURED BEST RESULTS

Send drawing or model for examination and report as to patentability

WATSON E. COLEMAN, Patent Lawyer
644 G. Street, N. W., Washington, D. C.

HELP WANTED

District Distributors—Agents
Make big money with Radiolite, marvelous battery electrolyte. Better and quicker than expensive 8-hour charging system. Removes and prevents sulphation in auto and radio batteries, makes frequent recharging unnecessary. Preserves plates and prolongs life of any battery. Great opportunity for live dealers. Radiolite is the original product and is protected by U. S. and foreign patents. Gallon free for testing.

RADIOLITE CO., St. Paul, Minn.

An old established concern producing automobile lighting equipment in all forms desires manufacturers agents to sell jobbing trade. None considered unless names of concerns now representing are given along with territory covered and method of operating. Address Box E 6151, care of MOTOR AGE, 5 S. Wabash Ave., Chicago, Illinois

MISCELLANEOUS

SIMPLIFY THE WORK in your Auto Repair Shop by sending for our free booklets: "Hadoo Safeguard System for Double Checking the Time, Material and Tool Losses" and "How to Lay Out the Auto Stock Room" and free samples of repair orders, job tickets, time sheets, parts sales slips, auto bin markers, card holders and auto stock boxes. Haddon Bin Label Co., Haddon Heights, N. J.

Vulcanizing and Tire Repair Plant at sacrifice price for quick cash sale. Fantus Bros., 1321 So. Oakley, Chicago.



New Junior Assortment Cotter Pins

The only practical and profitable arrangement for quick, counter sales of Cotter Pins—and the best Cotter Pin Assortment for Garages and Repair Shops. The cases are very durable and covered with black leatherette, neatly marked—both lids strongly reinforced where hinged. When closed Cutters cannot be shaken out of their compartments.

We manufacture all sizes of Cotter Pins, Regular Assortments in screw top boxes and special assortments as specified.

ORDER FROM YOUR JOBBER

WESTERN WIRE PRODUCTS COMPANY
ST. LOUIS, MO.

Increase the EARNING capacity of your garage

by using DICKERSON Turntable and Service Jacks. Cars moved instantly—easily. Spring replacements and chassis repairs made in much less time—raises car frame by any fraction of an inch, making bolt holes line up perfectly. Works where no other jack will—does work impossible with others. Mechanism like heavy truck drive. Handles all cars—bumpers, trunk racks, etc., do not interfere. One man easily raises heavy truck.

Write for catalog. Some valuable territory open for "live jobbers."

C. A. Dickerson Compressor Corp.
220-22 Chicago St., Buffalo, N. Y.

**DICKERSON
GARAGE JACKS
AIR COMPRESSORS
SHOP EQUIPMENT**



Turntable Jack No. 11

Index to the

The Advertisers' Index is published as a convenience and not as a part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

Adjustable Bearing Co., Inc.	115	Continental Sales Corp.	88
Ahlberg Bearing Co.	113	Crescent Tool Co.	82
Ajax Auto Parts Co.	76	Cronk, E. D. & A. F., Inc.	110
Akron-Selle Co.	110	Curtis Pneumatic Mach. Co.	59
Albertson & Co.	81		
Allen Mfg. Co., The	116	Dickerson, C. A., Compressor Corp.	118
Almond, T. R., Mfg. Co.	88	Dill Mfg. Co.	113
American Asbestos Co.	114	Dimit Co., The	113
American Chain Co.	8	Durkee-Atwood Co.	115
Amer.-Hamm, Piston Ring Co.	112		
Anchor Electric Co.	108	Eastern Mach. Screw Corp.	112
Armature Rewinding Co.	108	Eaton Axle & Spring Co.	115
Atwater-Kent Mfg. Co.	116	Electric Parts Corp.	113
Auto-Diesel Piston Ring Co.	116		
Auto-Hone Co., The	116	Fedders Mfg. Co.	106
Autocoil Co., The	116	Fitzgerald Mfg. Co.	110
Automotive Maintenance Mach. Co.	116	Forest Electric Co.	113
		Foster-Johnson Reamer Co.	112
Bastian-Blessing Co.	88	Franklin Air Comp. Works	98
Bearings Co. of America	111	Fredericks, H. M., Co.	114
Bell Mfg. Co.	100		
Bellevue Mfg. Co.	116	Gates Rubber Co.	91
Bidlex Corp., The	115	Gaylord Mfg. Co.	110
Black & Decker Mfg. Co.		Gemco Mfg. Co.	113
	3rd Cover	General Automotive Corp.	78
Bonney Forge & Tool Works	88	General Fireproofing Co.	104
Bosch Magneto Corp., American	72 & 73	General Tire & Rubber Co.	60
Bosch, Robert, Magneto Co.	112	General Used Car Bureau	108
Broadcaster Department	117	Gilmer, L. H., Co.	115
Brookins Mfg. Co., The	102	Graton & Knight Mfg. Co.	102
Brunner Mfg. Co.	115	Green Engineering Co.	111
Burd High Comp. Ring Co.	114		
Burton-Rogers Co.	88	Hall Cylinder Hone Co., The	114
Business Methods Corp.	111	Harrison Radiator Corp.	81
Butler Automotive Service Co.	110	Hempy-Cooper Mfg. Co.	90
		Hobart Bros. Co.	113
C. & G. Wheel Puller Co.	116	Hollenden Hotel	100
Case, J. I., T. M. Co.	116	Holmes, Ernest, Co.	95
Chandler Motor Car Co.		Huetter Mach. & Tool Co.	110
	Back Cover	Hupp Motor Car Corp.	2nd Cover
Chevrolet Bros. Mfg. Co.	115	Hyatt Roller Bearing Co.	63
Chicago Solder Co.	112	Hyman Pressed Body Co.	115
Cincinnati Spec. Mfg. Co., Inc.	110		
Cincinnati Victor Co., The	100	Inshield Prod. Co.	110
Cloyes Gear Works	115		
Colonial Gear & Mfg. Co.	113	Jacobs Auto Safety Lamp Co., Inc.	115
Columbia Motor Car Co.	112	Jacobs Mfg. Co.	80
Comfort Printing Spec. Co.	107	Johns-Manville, Inc.	65 to 68
Connaut Packing Co., The	113	Johnson Automobile Lock Co.	8
Continental Battery Co.	115		

Advertisements

Johnson Gas Appliance Co. 112
Jordan Motor Car Co. Front Cover

K. D. Lamp Co., The 106
Kawneer Co., The 110
Kellogg Mfg. Co. 114
Kelso Mfg. Co. 116
Kennedy & Co. 107
Key Boiler Equipment Co. 104
King Sewing Machine Co. 114
Kissel Motor Car Co. 92
Kokomo Electric Co. 93
Kokomo Rubber Co. 116

Laminated Shim Co., Inc. 4
Landis Tool Co. 111
Laseo Corp. 114
Las-Stik Patch Mfg. Co. 103
Little Wonder Valve Co. 115
Lorentzen Headlight Kontrol, Inc. 114
Louisville Elec. Mfg. Co. 111
Lux Clock Mfg. Co. 109

Manhattan Rubber Co. 115
Manley Mfg. Co. 111
Mechem Gear Corp. 115
Mechanical Production Co. 112
Mercury Body Corp. 97
Milwaukee Die Casting Co. 112
Milwaukee Motor Prods., Inc. 77
Miniature Incandescent Lamp Corp. 74
Monarch Shock Absorber Co. 114
Mosler Metal Prod. Corp. 114
Mountain Accessory Co. 80

N. & N. Hydrometer Co. 115
New Departure Mfg. Co. 85
No-Leak-O Piston Ring Co. 112
Norma Co. of America 119
Northwestern Chemical Co. 79
Norwalk Auto Parts Co. 112

Oakland Motor Car Co. 6
Oxweld Acetylene Co. 88

Pacific Rim Tool Co. 119
Packard Elec. Co., The 114
Paraffector Co., The 114
Peerless Motor Car Co. 112
Piston Ring Co., The 1

R. I. V. Co. 105
Radiant Oil Co., Inc. 113

Radiator Eng. Co. 113
Ramsey Acc. Mfg. Co. 75
Red Giant Tool Corp. 116
Remington Cash Register Co. 83
Republic Motor Truck Co. 114
Rice, Chas. W., & Co. 108
Roach, R. N., Co. 109
Rose, Frank, Mfg. Co. 101

Sales Equipment Co., Inc. 110
Savidge Shock Absorber Co. 107
Sav-Oil Ring Mfg. Co. 99
Service Equipment Associates 88
Shawver Co., The 111
Solenberger Piston Ring Co. 105
Speed-O-Multiple Valve Lifter Corp. 116
Steinberg Products Co. 116
Stevens & Co. 109
Stewart-Warner Speed. Corp. 114
Storm Mfg. Co. 108
Strom Ball Bearing Mfg. Co. 57
Studebaker Corp., The 5
Stutz Motor Co. 120
Suburban Transit Co. 112
Sundstrand Adding Mach. Co. 87

Thermoid Rubber Co. 70 & 71
Timken Roller Bearing Co. 115
Toledo Steel Products Co. 89
Trainer Nat'l. Spring Co. 2
Tripp-Secord Co. 114
Tyson Mfg. Co. 116

United Mfg. & Dist. Co. 64
U. S. Auto Supply Co. 91
U. S. Chain & Forging Co. 60
Universal Industrial Corp. 113
Van Norman Mach. Tool Co. 88
Vesta Battery Corp. 113

Wall Pump & Compressor Co. 112
Warford Corp. 113
Watkins Mfg. Co. 61
Watson, John Warren, Co. 62
Waukesha Motor Co. 111
Wayne Tool Mfg. Co. 110
Weaver Mfg. Co. 7
Wedge-Rite 110
Weidenhoff, Joseph, & Co. 111
Wel-Ever Piston Ring Co. 113
Welker-Hoops Mfg. Co. 103
Western Wire Prod. Co. 118
Wilkening Mfg. Co. 116
Wood-Imes Mfg. Co. 113
Wright Mfg. Co. 88

Zenith-Detroit Corp. 112

PACIFIC RIM TOOL

Reward
Offered!



For a better, safer, quicker-acting rim removing tool than the Pacific there is a reward awaiting someone. Here is a job that even the most influential detective agencies will pass up. So why try to find "what isn't"?

"Pacific" is a reward in itself. We have been awarded first rank. You can be rewarded with a faithful, dependable servant. A Hercules for strength—a Mercury for speed.

PACIFIC RIM TOOL COMPANY

16606 Waterloo Road
Cleveland, Ohio

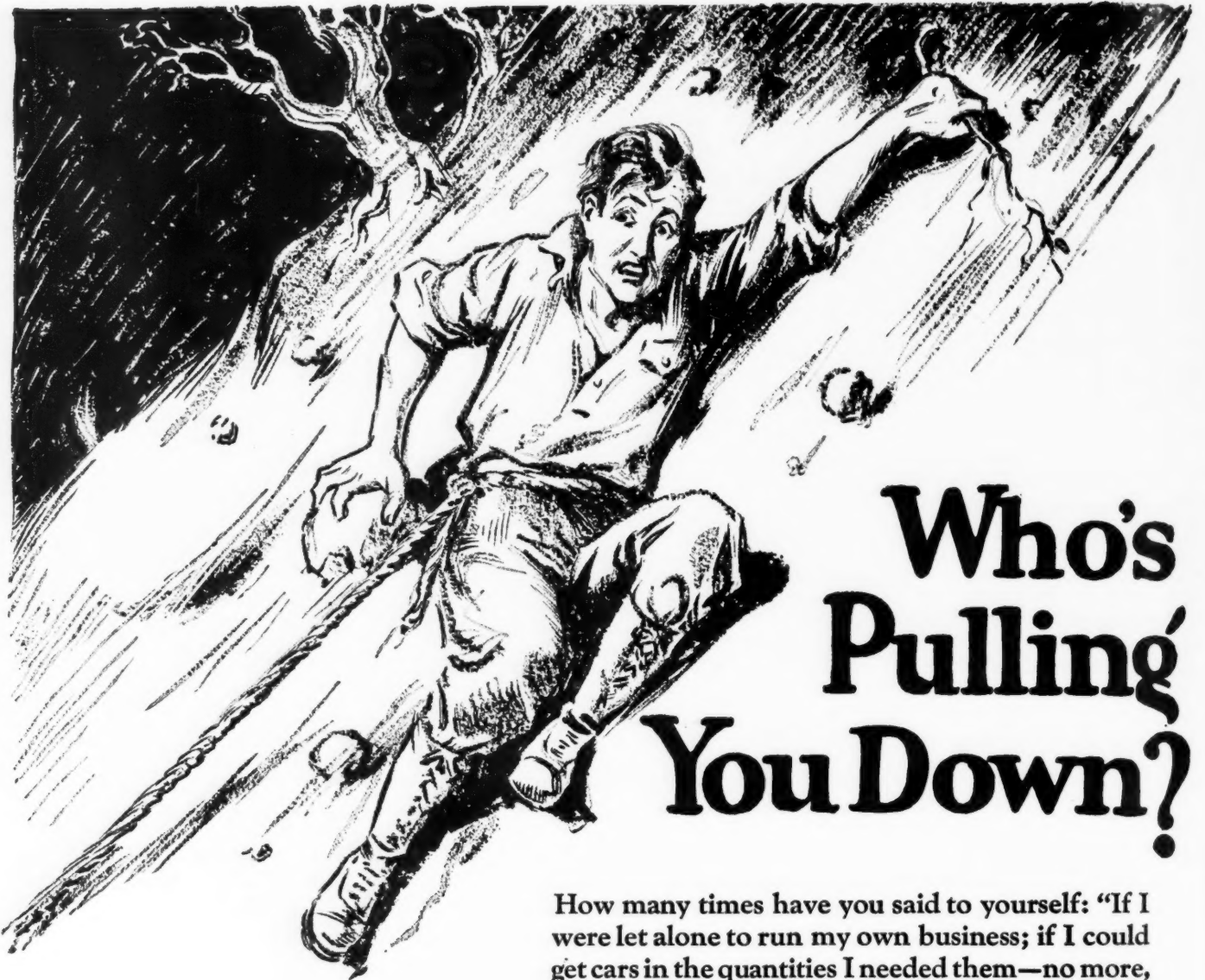
Export Office
1834 Broadway
New York City

2339 11th Ave. N.
Seattle, Wash.

"NORMA" BALL BEARINGS



THE NORMA COMPANY OF AMERICA
ANABLE AVE., LONG ISLAND CITY, N.Y.



Who's Pulling You Down?

How many times have you said to yourself: "If I were let alone to run my own business; if I could get cars in the quantities I needed them—no more, no less; if I could put my profit in the bank instead of into unproductive expense, I could make money in the automobile business."

A Stutz franchise does that—and more. To be sure, it doesn't work miracles but it puts the automobile dealer's business on a safe and sane basis.

Besides, all of the advantages of the new Stutz merchandising plan are now available to Stutz Distributors and Dealers, assuring a net saving of from 6% to 12% per annum over and above the normal profit.

Write for full particulars.



From a Stutz Distributor's Letter

Dated May 19, 1924

"Your merchandising plan is the best thing that ever happened, and means the closing of all territory immediately. It will increase your sales 50% at least. It is sure to be a success."

STUTZ SIXES

STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Indiana

Builders of the Original and Genuine Stutz Motor Cars

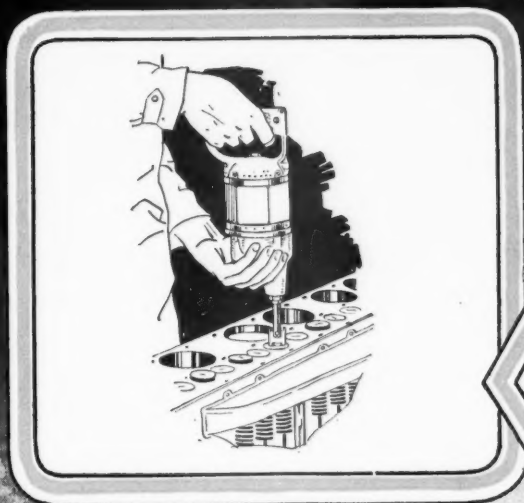
"The price may seem high, but I can show you how every minute was spent"

How often have you used these very words?

The customer "kicks" because he thinks you are overcharging him, but your time cards show that the time actually went into the job.

The car owner knows you are not dishonest, so he comes to the conclusion that you do not work fast enough, but that doesn't help you when he finds that someone else can do the job in less time.

Usually the answer is that the man who does it in less time (consequently at less cost) has a better equipped shop and doesn't have to perform very many operations by the old hand methods.



THE BEST EQUIPPED SHOP
GETS THE BUSINESS."



The **BLACK & DECKER**

ELECTRIC VALVE GRINDER and THE BLACK AND DECKER QUARTER-INCH ELECTRIC DRILL with a WIRE CARBON CLEANING BRUSH save from one to six hours on a valve grinding and carbon cleaning job.

The original investment is small and is quickly earned by the tools themselves, AND BECAUSE YOU CAN DO A BETTER JOB FASTER YOU GET THE BUSINESS. Ask your jobber's salesman to demonstrate.

We will be glad to send you special bulletin on VALVE GRINDING AND CARBON CLEANING if you will drop a line to

***THE* BLACK & DECKER MFG. CO.**

TOWSON, MD.

Canadian Factory, Lyman Tube Bldg., Montreal, P. Q.

Why Not Sell a Modern Car?

THE easiest way for a dealer to lose his shirt these days is to keep on trying to sell a car that has not been brought up to date.

The public has been too well sold on the value of certain recent developments. They will get them from you—or go around the corner.

If you are handling the 1925 Chandler, they won't have occasion to be going around the corner.

On your floor will be today's most modern car —

—the only car containing the infallible, clash-proof Traffic Transmission and the famous Pikes Peak Motor —

—the only car combining these valued units with genuine supersize balloon tires as standard equipment and 4-wheel brakes as optional equipment at so moderate an extra charge.

Note—We have a new policy on local advertising that you should know about. Write

(The Traffic Transmission is built complete in the Chandler plant under Campbell patents.)

THE CHANDLER MOTOR CAR COMPANY • CLEVELAND
Export Department, 1819 Broadway, New York City Cable Address, "CHANMOTOR"

1925 CHANDLER

T H E C A R O F T H E Y E A R